

EXHIBIT F

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

Valtrus Innovations Ltd.

Plaintiff,

v.

CyrusOne, LLC

Defendant.

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CIVIL ACTION NO. 2:24-cv-00259

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT AND JURY DEMAND

Plaintiff Valtrus Innovations Limited (“Plaintiff” or “Valtrus”), by and through its undersigned counsel, brings this complaint for patent infringement and damages against Defendant CyrusOne, LLC (“CyrusOne” or “Defendant”) and would respectfully show the Court as follows:

PARTIES

1. Valtrus is the successor-in-interest to a substantial patent portfolio created by Hewlett Packard Enterprise and its predecessor, subsidiary, and affiliate companies (collectively, “HPE”). Valtrus is an Irish entity duly organized and existing under the laws of the Republic of Ireland. The address of the registered office of Valtrus is: The Glasshouses GH2, 92 Georges Street Lower, Dun Laoghaire, Dublin A96 VR66, Ireland. HPE’s worldwide corporate headquarters is located in Houston, Texas. One of HPE’s primary U.S. facilities is located in Plano, Texas.

2. On information and belief, CyrusOne is a limited liability company organized and existing under the laws of the State of Delaware, with a principal place of business at 2850 North Harwood Street, Suite 2200, Dallas, TX 75201. CyrusOne has a regular and established place of business at three data centers located in this District: DFW1, 1649 West Frankford Rd., Carrollton,

TX 75007; DFW2, 2501 S. State Hwy 121, Business Suite 500 (Bldg #5), Lewisville, TX 75067; and DFW3, 2300 Chelsea Blvd, Allen, TX 75013 (collectively referred to as “DFW Data Centers”). On information and belief, CyrusOne may be served with process through its registered agent at Corporation Service Company, 211 East 7th St., Suite 620, Austin, TX 78701.

PATENTS IN SUIT

3. Valtrus is the assignee of and owns all right and title to U.S. Patent Nos. 6,718,277 (the “’277 Patent”); 6,854,287 (the “’287 Patent”); 6,862,179 (the “’179 Patent”); 7,031,870 (the “’870 Patent”); 7,339,490 (the “’490 Patent”); 9,310,855 (the “’855 Patent”); and 7,939,967 (the “’967 Patent”) (collectively, “the Asserted Patents”).

4. The Asserted Patents were developed by inventors working for HPE. HPE developed numerous innovative and diverse technologies, including groundbreaking inventions pertaining to data center cooling, analytics for monitoring conditions in data centers, and structural organization of data centers.

5. The ’277 Patent, entitled “Atmospheric control within a building,” was duly and lawfully issued on April 6, 2004. A true and correct copy of the ’277 Patent is attached hereto as Exhibit 1.

6. The ’277 Patent was in full force and effect since its issuance. Valtrus owns by assignment the entire right and title in and to the ’277 Patent, including the right to seek damages, including past damages, for any infringement thereof.

7. The ’287 Patent, entitled “Cooling system,” was duly and lawfully issued on February 15, 2005. A true and correct copy of the ’287 Patent is attached hereto as Exhibit 2.

8. The '287 Patent was in full force and effect since its issuance. Valtrus owns by assignment the entire right and title in and to the '287 Patent, including the right to seek damages, including past damages, for any infringement thereof.

9. The '179 Patent, entitled "Partition for varying the supply of cooling fluid," was duly and lawfully issued on March 1, 2005. A true and correct copy of the '179 Patent is attached hereto as Exhibit 3.

10. The '179 Patent was in full force and effect since its issuance. Valtrus owns by assignment the entire right and title in and to the '179 Patent, including the right to seek damages, including past damages, for any infringement thereof.

11. The '870 Patent, entitled "Data center evaluation using an air re-circulation index," was duly and lawfully issued on April 18, 2006. A true and correct copy of the '870 Patent is attached hereto as Exhibit 4.

12. The '870 Patent has been in full force and effect since its issuance. Valtrus owns by assignment the entire right and title in and to the '870 Patent, including the right to seek damages, including past damages, for any infringement thereof.

13. The '490 Patent, entitled "Modular sensor assembly," was duly and lawfully issued on March 4, 2008. A true and correct copy of the '490 Patent is attached hereto as Exhibit 5.

14. The '490 Patent has been in full force and effect since its issuance. Valtrus owns by assignment the entire right and title in and to the '490 Patent, including the right to seek damages for any infringement thereof.

15. The '855 Patent, entitled "Flexible data center and methods for deployment," was duly and lawfully issued on April 12, 2016. A true and correct copy of the '855 Patent is attached hereto as Exhibit 6.

16. The '855 Patent has been in full force and effect since its issuance. Valtrus owns by assignment the entire right and title in and to the '855 Patent, including the right to seek damages, including past damages, for any infringement thereof.

17. The '967 Patent, entitled "Multiple Power Supply Control," was duly and lawfully issued on May 10, 2011. A true and correct copy of the '967 Patent is attached hereto as Exhibit 7.

18. The '967 Patent has been in full force and effect since its issuance. Valtrus owns by assignment the entire right and title in and to the '967 Patent, including the right to seek damages, including past damages, for any infringement thereof.

19. CyrusOne has been on notice of the Asserted Patents and its infringement since at least April 1, 2024. Valtrus sent CyrusOne a letter on March 29, 2024 regarding a Notice of Infringement of Valtrus Innovation Ltd.'s Patents ("Notice Letter"). The Notice Letter was delivered to CyrusOne on April 1, 2024. The Notice Letter was addressed to CyrusOne's Executive Vice President, General Counsel & Secretary Robert M. Jackson, and provided the specific factual basis for Valtrus' allegations of infringement. The Notice Letter also proposed a meeting to discuss a potential license or other arrangement between Valtrus and CyrusOne.

20. CyrusOne, through Mr. Jackson, responded to the Notice Letter on April 11, 2024 declining Valtrus' request for a meeting.

JURISDICTION AND VENUE

21. Valtrus incorporates by reference paragraphs 1-20 herein.

22. This civil action arises under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*, including without limitation 35 U.S.C. §§ 271, 281, 283, 284, and 285. This is a patent infringement lawsuit over which this Court has subject matter jurisdiction under, *inter alia*, 28 U.S.C. §§ 1331, 1332, and 1338(a).

23. This District has general and specific personal jurisdiction over CyrusOne because, directly or through intermediaries, CyrusOne has committed acts within this District giving rise to this action; is present in and transacts and conducts business, directly, and/or indirectly, in this District and the State of Texas; and transacts and conduct business with residents of this District and the State of Texas.

24. Valtrus's causes of action arise, at least in part, from CyrusOne's contacts with and activities in and/or directed at this District and the State of Texas.

25. CyrusOne has infringed the Asserted Patents within this District and the State of Texas by making, using, selling, offering for sale, and/or importing in or into this District and elsewhere in the State of Texas, products and services covered by claims in the Asserted Patents, including without limitation products that, when made or used, practice the claimed methods of the Asserted Patents. CyrusOne, directly and through intermediaries, makes, uses, sells, offers for sale, imports, ships, distributes, advertises, promotes, and/or otherwise commercializes such infringing products and services in or into this District and the State of Texas. CyrusOne regularly conducts and solicits business in, engages in other persistent courses of conduct in, and/or derives substantial revenue from goods and services provided to residents of this District and the State of Texas.

26. This Court has personal jurisdiction over CyrusOne pursuant to TEX. CIV. PRAC. & REM. CODE § 17.041 *et seq.*

27. Venue is proper in this District under 28 U.S.C. §§ 1391(b)-(c) and 1400(b).

28. CyrusOne is doing business, either directly or through respective agents, on an ongoing basis in this Judicial District and elsewhere in the United States and has committed acts of infringement in this district. CyrusOne has a regular and established place of business in this

Judicial District, including at its DFW Data Centers. On information and belief, CyrusOne makes, uses, sells, offers to sell, and/or imports infringing products into and/or within this District, including at its DFW Data Centers. CyrusOne maintains a permanent and/or continuing presence within this District at its DFW Data Centers, and has the requisite minimum contacts with this District such that this venue is a fair and reasonable one. Upon information and belief, CyrusOne has transacted and, at the time of the filing of the Complaint, is continuing to transact business within this District.

FIRST CLAIM

(Infringement of the '277 Patent)

29. Valtrus re-alleges and incorporates herein by reference paragraphs 1-28 of its Complaint.

30. The '277 Patent is generally directed to atmospheric control within a building.

31. CyrusOne has, under 35 U.S.C. § 271(a), directly infringed, literally and/or under the doctrine of equivalents, one or more claims, including without limitation at least claim 1, of the '277 Patent, by making, using, selling, offering for sale, and/or importing systems in its data centers for cooling, or otherwise controlling atmospheric conditions within, the data centers. For example, on information and belief, and before the expiration of the '277 Patent, CyrusOne operated cooling systems in its data centers in a manner that infringed the '277 Patent. An exemplary claim chart demonstrating one way in which CyrusOne infringed claim 1 of the '277 Patent is attached as Exhibit 8.

32. As a result of CyrusOne's infringing activity, Valtrus has been damaged.

SECOND CLAIM

(Infringement of the '287 Patent)

33. Valtrus re-alleges and incorporates herein by reference paragraphs 1-32 of its Complaint.

34. The '287 Patent is generally directed to a system and method for cooling a room configured to house a plurality of computer systems.

35. CyrusOne has, under 35 U.S.C. § 271(a), directly infringed, literally and/or under the doctrine of equivalents, one or more claims, including without limitation at least claim 1 of the '287 Patent, by making, using, selling, offering for sale, and/or importing systems in its datacenters for cooling the datacenters. For example, on information and belief, and before the expiration of the '287 Patent, CyrusOne operated cooling systems in its data centers in a manner that infringed the '287 Patent. An exemplary claim chart demonstrating one way in which CyrusOne infringed claim 1 of the '287 Patent is attached as Exhibit 9.

36. As a result of CyrusOne's infringing activity, Valtrus has been damaged.

THIRD CLAIM

(Infringement of the '179 Patent)

37. Valtrus re-alleges and incorporates herein by reference paragraphs 1-36 of its Complaint.

38. The '179 Patent is generally directed to a partition for varying the supply of cooling fluid in a data center.

39. CyrusOne has, under 35 U.S.C. § 271(a), directly infringed, literally and/or under the doctrine of equivalents, one or more claims, including without limitation at least claim 1 of the '179 Patent, by making, using, selling, offering for sale, and/or importing cooling systems in its

data centers, including a partition for varying the supply of cooling fluid. For example, on information and belief, and before the expiration of the '179 Patent, CyrusOne operated cooling systems in its data centers in a manner that infringes the '179 Patent. An exemplary claim chart demonstrating one way in which CyrusOne infringes claim 1 of the '179 Patent is attached as Exhibit 10.

40. As a result of CyrusOne's infringing activity, Valtrus has been damaged.

FOURTH CLAIM

(Infringement of the '870 Patent)

41. Valtrus re-alleges and incorporates herein by reference paragraphs 1-40 of its Complaint.

42. The '870 Patent is generally directed to a system and method for evaluating one or more components in a data center.

43. CyrusOne has been on notice of the '870 Patent and a specific factual basis for its infringement of the '870 Patent since at least the date of Valtrus' Notice Letter. On information and belief, CyrusOne did not take any action to stop its infringement.

44. CyrusOne has, under 35 U.S.C. § 271(a), directly infringed, literally and/or under the doctrine of equivalents, one or more claims, including without limitation at least claim 1 of the '870 Patent, by making, using, selling, offering for sale, and/or importing cooling systems in its data centers. For example, on information and belief, CyrusOne operates cooling systems in its data centers in a manner that infringes the '870 Patent. An exemplary claim chart demonstrating one way in which CyrusOne infringes claim 1 of the '870 Patent is attached as Exhibit 11.

45. To the extent CyrusOne has failed to take any action to stop its infringement after being placed on notice of the above, such infringement has been willful.

46. As a result of CyrusOne's infringing activity, Valtrus has been damaged.

FIFTH CLAIM

(Infringement of the '490 Patent)

47. Valtrus re-alleges and incorporates herein by reference paragraphs 1-46 of its Complaint.

48. The '490 Patent is generally directed to a modular sensor assembly for sensing conditions at a computer rack, such as environmental conditions.

49. CyrusOne has been on notice of the '490 Patent and a specific factual basis for its infringement of the '490 Patent since at least the date of Valtrus' Notice Letter. On information and belief, CyrusOne did not take any action to stop its infringement.

50. CyrusOne has, under 35 U.S.C. § 271(a), directly infringed, literally and/or under the doctrine of equivalents, one or more claims, including without limitation at least claim 1 of the '490 Patent, by making, using, selling, offering for sale, and/or importing modular sensor assemblies for sensing conditions such as temperature at a computer rack in its data centers. For example, on information and belief, CyrusOne's data centers operate using modular sensor assemblies that infringe the '490 Patent. An exemplary claim chart demonstrating one way in which CyrusOne infringes claim 1 of the '490 Patent is attached as Exhibit 12.

51. To the extent CyrusOne has failed to take any action to stop its infringement after being placed on notice of the above, such infringement has been willful.

52. As a result of CyrusOne's infringing activity, Valtrus has been damaged.

SIXTH CLAIM

(Infringement of the '855 Patent)

53. Valtrus re-alleges and incorporates herein by reference paragraphs 1-52 of its Complaint.

54. The '855 patent is generally directed to a flexible data center and methods for deployment of flexible data centers.

55. CyrusOne has been on notice of the '855 Patent and a specific factual basis for its infringement of the '855 Patent since at least the date of Valtrus' Notice Letter. On information and belief, CyrusOne did not take any action to stop its infringement.

56. CyrusOne has, under 35 U.S.C. § 271(a), directly infringed, literally and/or under the doctrine of equivalents, one or more claims, including without limitation at least claim 8 of the '855 Patent, by making, using, selling and/or offering for sale flexible data centers. For example, on information and belief, CyrusOne's DFW1 Data Center located in this District (as well as other data centers across the United States) infringes the '855 Patent. An exemplary claim chart demonstrating one way in which CyrusOne infringes claim 8 of the '855 Patent is attached as Exhibit 13.

57. To the extent CyrusOne has failed to take any action to stop its infringement after being placed on notice of the above, such infringement has been willful.

58. As a result of CyrusOne's infringing activity, Valtrus has been damaged.

SEVENTH CLAIM

(Infringement of the '967 Patent)

59. Valtrus re-alleges and incorporates herein by reference paragraphs 1-58 of its Complaint.

60. The '967 patent is generally directed to multiple power supply control in data centers.

61. CyrusOne has been on notice of the '967 Patent and a specific factual basis for its infringement of the '967 Patent since at least the date of Valtrus' Notice Letter. On information and belief, CyrusOne did not take any action to stop its infringement.

62. CyrusOne has, under 35 U.S.C. § 271(a), directly infringed, literally and/or under the doctrine of equivalents, one or more claims, including without limitation at least claim 1 of the '967 Patent, by making, using, selling and/or offering for sale data centers using multiple power supply control. For example, on information and belief, CyrusOne's redundant power systems in its U.S. data centers infringe the '967 Patent. An exemplary claim chart demonstrating one way in which CyrusOne infringes claim 1 of the '967 Patent is attached as Exhibit 14.

63. To the extent CyrusOne has failed to take any action to stop its infringement after being placed on notice of the above, such infringement has been willful.

64. As a result of CyrusOne's infringing activity, Valtrus has been damaged.

PRAYER FOR RELIEF

WHEREFORE, Valtrus prays for judgment against CyrusOne as follows:

- A. That CyrusOne has infringed each of the Asserted Patents, and unless enjoined, will continue to infringe one or more of the applicable Asserted Patents;
- B. That CyrusOne's infringement of one or more of the applicable Asserted Patents has been willful;
- C. That CyrusOne pay Valtrus damages adequate to compensate Valtrus for CyrusOne's past infringement of each of the Asserted Patents, and present and future infringement of the applicable Asserted Patents, together with interest and costs under 35 U.S.C. § 284;
- D. That CyrusOne pay prejudgment and post-judgment interest on the damages assessed;
- E. That CyrusOne pay Valtrus enhanced damages pursuant to 35 U.S.C. § 284;

- F. That CyrusOne be enjoined from infringing the '870, '490, '855, and '967 Patents, or if its infringement is not enjoined, that CyrusOne be ordered to pay ongoing royalties to Valtrus for any post-judgment infringement of the '870, '490, '855, and '967 Patents;
- G. That this is an exceptional case under 35 U.S.C. § 285; and that CyrusOne pay Valtrus's attorneys' fees and costs in this action; and
- H. That Valtrus be awarded such other and further relief, including equitable relief, as this Court deems just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Federal Rule of Civil Procedure 38(b), Valtrus hereby demands a trial by jury on all issues triable to a jury.

April 18, 2024

Respectfully submitted,

/s/ Eric H. Findlay

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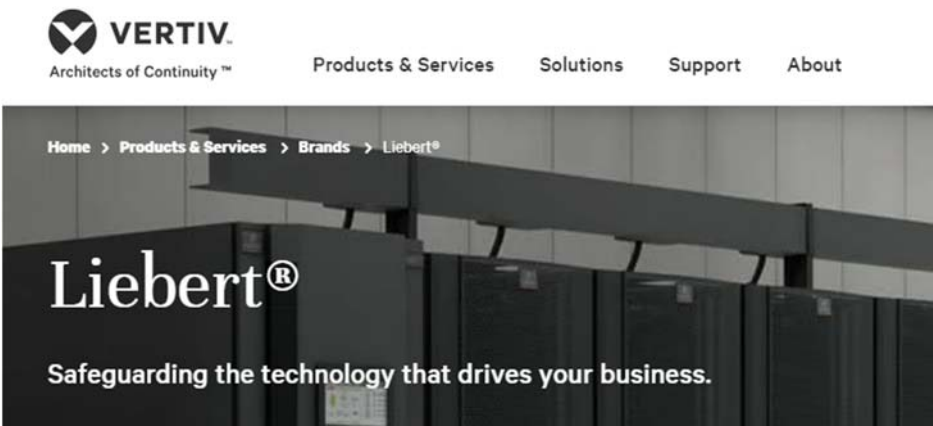
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Attorneys for Plaintiff
Valtrus Innovations Limited



Exhibit 8

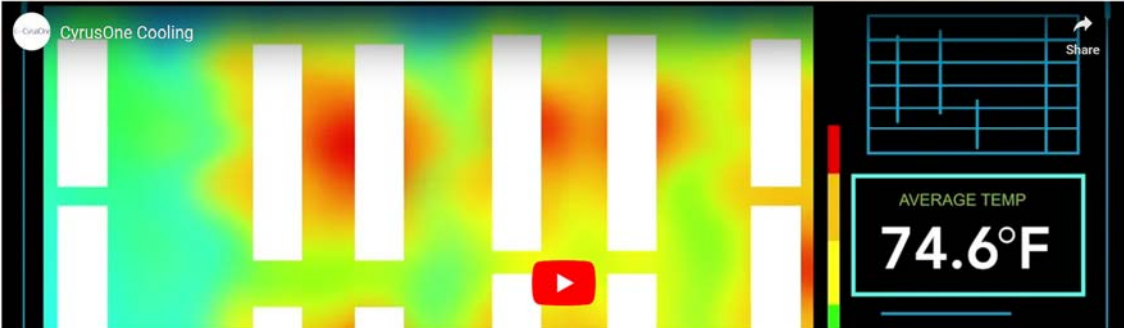
U.S. Patent No. 6,718,277 – Infringement Claim Chart

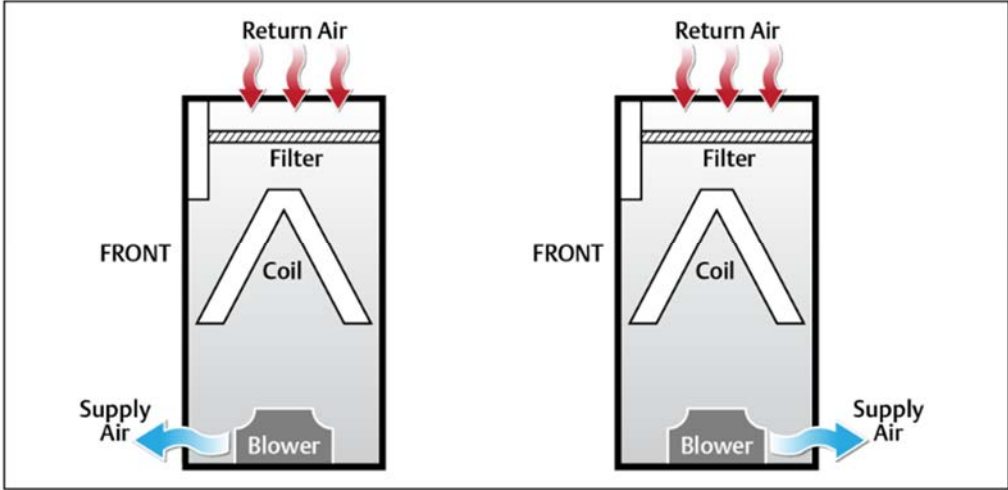
Claim 1	Exemplary Evidence of Infringement by CyrusOne
<p>[1pre] A method of controlling atmospheric conditions within a building, said method comprising the steps of:</p>	<p>CyrusOne’s data centers use a method of controlling atmospheric conditions within a building.</p> <p>CyrusOne uses Vertiv and Liebert cooling in its U.S. data centers to control atmospheric conditions. Liebert’s cooling units are controlled, for example, by Liebert’s iCOM and/or iCOM-S Intelligent Communication and Monitoring System, which uses a method for evaluating one or more components in a data center.</p> <div data-bbox="787 649 1022 972"> <p>CIN99</p> <p>CyrusOne Data Center Cincinnati - Blue Ash 4600 McAuley Place, 4th Floor Cincinnati, OH 45242</p> <p>Located on McAuley Place, this Cincinnati data center facility is for customers that require a robust data center for mission-critical applications, as well as for disaster recovery and business continuity environments.</p> </div> <div data-bbox="1066 654 1890 1230">   <p>Overview</p> <ul style="list-style-type: none"> • 15,000 sq. ft. data center/8,000 colo square feet (CSF) • Up to 900 kW available • 12-inch raised floor design • 20, and 22 ton Liebert Downflow Chilled Water CRAC units. </div> <p>https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 1.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p data-bbox="814 298 955 347">Cooling</p> <ul data-bbox="814 375 1409 678" style="list-style-type: none"><li data-bbox="814 375 1058 423">• N+1 Cooling<li data-bbox="814 461 1388 509">• Redundant DX and Glycol Chillers<li data-bbox="814 547 1409 596">• Redundant raised floor CRAC units<li data-bbox="814 633 1129 678">• 12in Raised floor <p data-bbox="766 743 1638 816">https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 2.</p> <div data-bbox="766 889 1694 1312"><p>The screenshot shows the Vertiv website header with the logo and navigation links: Products & Services, Solutions, Support, and About. Below the header is a breadcrumb trail: Home > Products & Services > Brands > Liebert®. The main banner features the Liebert® logo and the tagline 'Safeguarding the technology that drives your business.' over a background image of server racks.</p></div> <p data-bbox="766 1333 1461 1369">https://www.vertiv.com/en-us/products/brands/liebert/</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	 <p data-bbox="766 609 1879 690">https://www.vertiv.com/49d637/globalassets/shared/liebert-icom-thermal-system-controls-brochure.pdf (“iCOM Brochure”).</p>

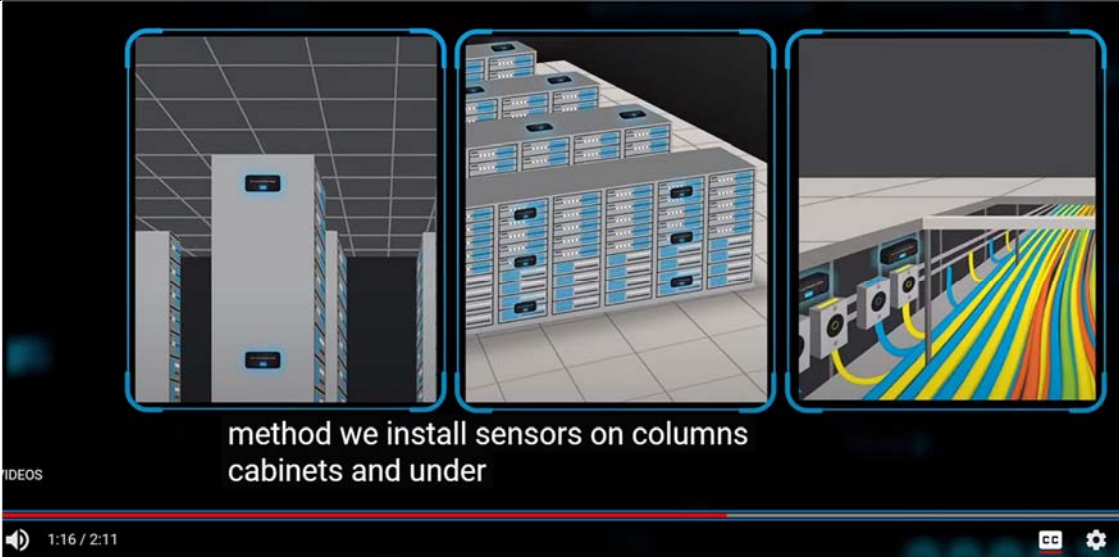
Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<div><p>At the cooling unit level, the Liebert iCOM unit control provides the highest protection available and optimal performance.</p><ul style="list-style-type: none">• Monitors 380 unit and component points to eliminate single points of failure• Self-healing features avoid passing unsafe operating thresholds• Highly intuitive, full-color, touch screen simplifies operations to save time and reduce human error• Multiple, automated unit protection routines, including lead/lag, cascade, rapid restart, refrigerant protection and valve calibration</div> <div></div> <div><p>At the supervisory level, the Liebert iCOM-S system control offers a revolutionary way to harmonize and optimize thermal system performance to optimize capacity across the data center, gain quick access to actionable data, and automate system diagnostics and trending.</p><ul style="list-style-type: none">• Advanced monitoring and at-a-glance reporting on performance metrics and trends for efficiency, capacity and adverse events• Up to 50% system efficiency gains• 30% lower deployment costs• Teamwork modes that prevent conflict between units and allow them to adapt to changes in facility and IT demand to improve efficiency and availability and reduce system wear and tear – saving more than \$10,000 per unit per year in energy costs• Simple and easy to deploy — auto-configuration to detect and configure up to 4,800 sensors, eliminating the need for custom integration to building management systems and cutting sensor deployment times in half<p>Liebert iCOM unit control and Liebert iCOM-S system control are available for new Vertiv™ data center cooling units or as retrofits.</p></div> <div></div> <div><p>iCOM Brochure at p. 3.</p><p>CyrusOne also uses CyrusOne cooling software to measure, monitor, and manage atmospheric conditions in its data centers.</p></div>


Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>CyrusOne's data center cooling systems are some of the most advanced in the world employing proactive and reactive methods to keep customer's data halls running at the most optimal temperatures.</p>  <p>https://www.cyrusone.com/data-center-solutions/colocation</p>
[1a] supplying a conditioned fluid inside said building;	<p>CyrusOne supplies a conditioned fluid inside said building.</p> <p>For example, CyrusOne uses CRAC units inside its data centers to supply conditioned fluid. CyrusOne uses Liebert to control atmospheric conditions in the data center with its CRAC units.</p> <p>CyrusOne supplies refrigerant (conditioned fluid) through the coil of its Liebert CRAC units. The Liebert CRAC unit receives the “return air” from the room and delivers cool conditioned “supply air” to the room (supplying conditioned fluid), by transferring heat from the air to the cooling fluid within the coil.</p>


Claim 1	Exemplary Evidence of Infringement by CyrusOne
	 <p>https://www.vertiv.com/4afe7d/globalassets/products/thermal-management/room-cooling/liebert-dse-80-165kw-23-43-tons-downflow-system-design-manual.pdf, at p. 6.</p> <p>Regardless of which type of CRAC units or which method of controlling atmospheric conditions are used (Liebert, CyrusOne, or others), CyrusOne supplies a conditioned fluid inside each of its data centers.</p>
[1b] sensing at least one atmospheric parameter in a plurality of locations inside said building;	<p>CyrusOne senses at least one atmospheric parameter in a plurality of locations inside said building.</p> <p>For example, CyrusOne uses Liebert iCOM. Liebert iCOM senses temperatures and humidity at locations throughout the data center.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p data-bbox="779 264 1115 285">User Temperature Setpoint Options</p> <p data-bbox="779 316 989 337">2nd Temperature Setpoint</p> <p data-bbox="827 362 1625 407">Alternate setpoint activated by customer input (remote alarm device). When customer input connection is 2nd Setpoint, this value becomes the active temperature setpoint.</p> <p data-bbox="779 433 999 454">BMS Backup Temp Setpoint</p> <p data-bbox="827 479 1684 524">Selects a temperature setpoint that activates in the event of a BMS timeout. The BMS timer must be configured for this setpoint to activate. See Setting BMS Backup Setpoints on page 117 .</p> <p data-bbox="779 550 972 571">Optimized Aisle Enabled</p> <p data-bbox="827 594 1675 639">Read-only. Indicates that iCOM™ is configured for optimized-aisle operation. See Teamwork Mode 3—Optimized Aisle Operation on page 102 .</p> <p data-bbox="779 665 1003 686">Temperature Control Sensor</p> <p data-bbox="827 711 1171 732">Selects sensor that controls cooling. Values are:</p> <ul data-bbox="842 743 1675 899" style="list-style-type: none">• Supply Sensor: Temperature control is based on maintaining the temperature of the discharge air from the cooling unit. See Supply Sensors on page 158 .• Remote Sensor: Temperature control is based on the temperature reading(s) from wired remote sensor(s). See Wired Remote Sensors on page 156 .• Return Sensor: Temperature control is based on maintaining the temperature of the air returning to the cooling unit.

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>User Humidity Setpoint Options</p> <p>Dew Point Setpoint</p> <p>Desired dew point (based on actual return air temperature and humidity) by adding moisture to or removing moisture from the air.</p> <p>Humidity Control Sensor</p> <p>Selects sensor used when calculating relative humidity.</p> <p>Humidity Control Type</p> <p>Control when staging humidification operations. Valid values:</p> <ul style="list-style-type: none"> • Relative: Percent of humidification/dehumidification is determined by the difference between the humidity-sensor reading and the humidity setpoint. • Compensated: Percent of humidification/dehumidification is determined by considering the actual deviation from the temperature setpoint and adjusts the humidity setpoint accordingly. The recalculated humidity setpoint displays on the screen. • Predictive: Percent of humidification/dehumidification is determined by considering the actual deviation from the temperature setpoint and adjusts the humidity sensor reading accordingly. The adjusted humidity sensor reading displays on the screen. • Dew point: Percent of humidification/dehumidification is determined by the difference between the dew point calculated from the humidity sensor reading and the dew point setpoint. <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf (“iCOM Manual”) at p. 15-16.</p> <p>CyrusOne also uses CyrusOne Cooling to sense temperatures based on real sensor readings at various locations inside the data center.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	 <p>method we install sensors on columns cabinets and under</p> <p>https://www.youtube.com/watch?v=yFMS-88wXn8, at 1:16.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	 <p>https://www.youtube.com/watch?v=yFMS-88wXn8, at 1:21.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	 <p>https://www.cyrusone.com/data-center-solutions/colocation , at 1:27;</p>
<p>[1c] generating an empirical atmospheric map from the results of said sensing step using software for processing input from said sensing step and for producing output in the form of said empirical atmospheric map;</p>	<p>CyrusOne an empirical atmospheric map from the results of said sensing step using software for processing input from said sensing step and for producing output in the form of said empirical atmospheric map.</p> <p>For example, CyrusOne uses Liebert iCOM. Liebert iCOM generates an empirical atmospheric map from the results of sensing temperature at individual racks. Liebert iCOM uses software for processing temperature inputs from the sensing step and produces output in the form of a data center temperature map.</p>

Claim 1

Exemplary Evidence of Infringement by CyrusOne



Integrate your Device and BMS Data

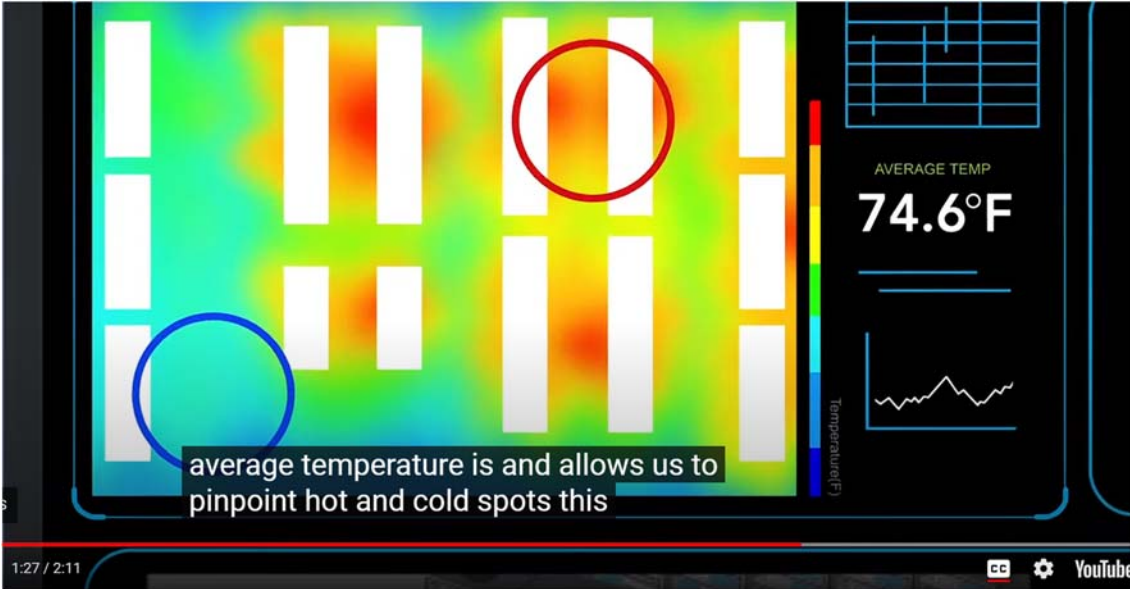
<https://www.youtube.com/watch?v=pJutGw7rrF0> at 0:43.

5.1 Preparing for U2U Group Set Up

Cooling units in the network will be assigned to groups, which affects how units function in teamwork, standby, rotation, and cascading operations. Especially in large rooms, it is important to consider several factors before setting up groups to balance cooling unit operation with room conditions.

NOTE: For ease of set-up and use, we recommend using only one group unless you have multiple rooms, differing software versions, or different types of cooling units.

1. Make a **map** of the room and indicate the location of all heat-generating devices and cooling units to plan for proper heat load management and cooling-air distribution.
2. Note the type of units by product/model, size, etc.
3. Determine the number of units to network together to ensure proper air flow and environmental control, up to 32 units.
4. Determine number of standby units.

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>iCOM Manual at p. 94.</p> <p>CyrusOne also uses CyrusOne cooling to generate a 3D temperature map based on real sensor readings retrieved throughout the data center. CyrusOne cooling processes temperature inputs from the sensing step and produces output in the form of a data center temperature map, which can be viewed as a calculated or measured map.</p>  <p>https://www.cyrusone.com/data-center-solutions/colocation, at 1:27;</p>
<p>[1d] comparing said empirical atmospheric map to a template atmospheric map; and</p>	<p>CyrusOne compares said empirical atmospheric map to a template atmospheric map.</p> <p>For example, CyrusOne uses Liebert iCOM. Liebert iCOM compares an empirical atmospheric map to a template atmospheric map, for instance by comparing current temperatures to template setpoints.</p>

Claim 1

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2.4 Viewing Sensor Data

The Sensor Data panel lists the standard and optional sensors monitored by iCOM™ and the current reading of each sensor.

- Touch , then  > Sensor Data. The SENSOR DATA panel opens.

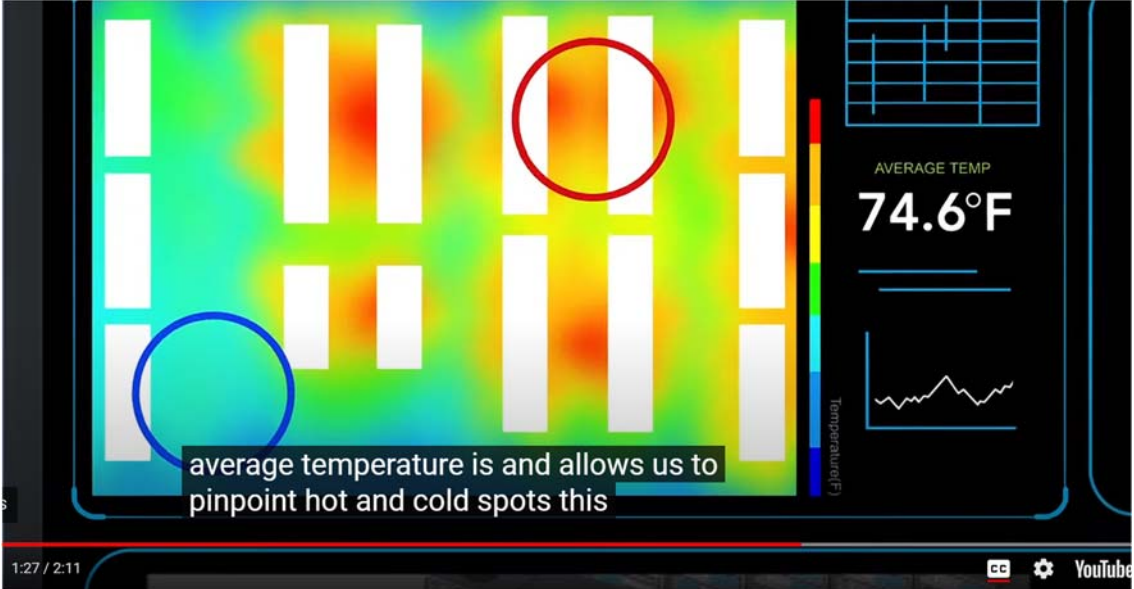
A secondary panel displays the DAILY SENSOR READING SUMMARY, which shows temperature, humidity and dew-point readings for the cooling unit.



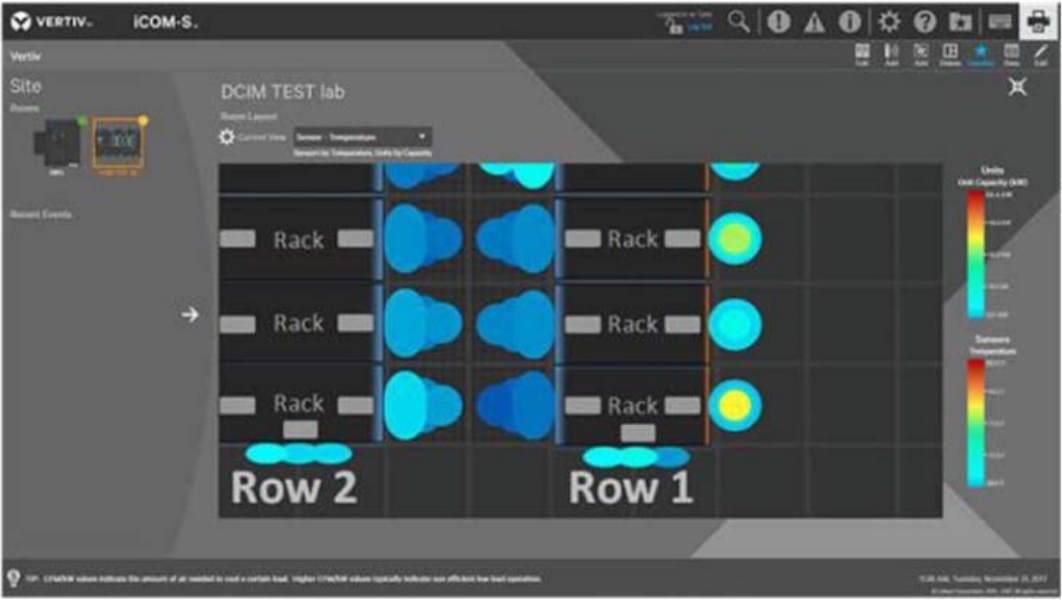
iCOM Manual at p. 20.

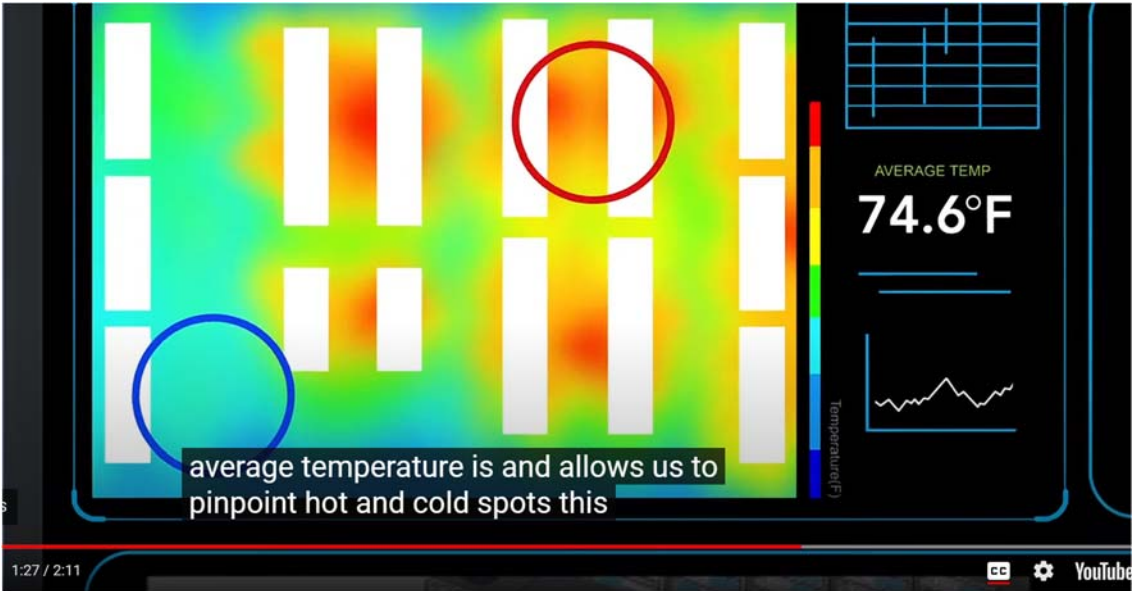


<https://www.dksh.com/global-en/products/iot/vertiv-thermal-control-and-monitoring>

CyrusOne also uses CyrusOne cooling to generate a 3D temperature map based on real sensor readings retrieved throughout the data center. The data center temperature map

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>can be viewed as a calculated or measured map. The measured map can be compared against a template map.</p>  <p>https://www.cyrusone.com/data-center-solutions/colocation , at 1:27;</p>
[1e] identifying pattern differentials between said empirical and template atmospheric maps.	<p>CyrusOne identifies pattern differentials between said empirical and template atmospheric maps.</p> <p>CyrusOne uses Liebert iCOM. Liebert iCOM identifies pattern differentials between the empirical and template maps, for example, by identifying when sensors are reporting conditions that exceed template conditions.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>4.2 Enabling Events and Editing Event Settings</p> <p>In the ALARMS & EVENTS panel, events are grouped into categories for easier management, for example, the factory set remote sensor alarms and humidification/dehumidification events. In some cases, touch the group heading provides edit options for the entire group, like thresholds, delays and enable/disable. Each event includes settings specific for that event and the notification option where event type and alarm notifications are selected (See Selecting Event Type and Setting Alarm/Warning Notification on the facing page).</p> <ol style="list-style-type: none"> 1. Touch , then  > Alarm/Event Setup. The ALARMS & EVENTS panel opens. 2. Scroll or search to find the event, touch the set's heading to display the properties and values for the entire set in the EDIT panel. – or – Touch an individual alarm or event to display it's specific values in the EDIT panel. <p>iCOM Manual at p. 80.</p>  <p>The screenshot displays the Vertiv iCOM-S software interface. The top navigation bar includes the Vertiv logo, 'iCOM-S', and various system status icons. The main area shows a 'DCIM TEST lab' environment with a grid of server racks. Each rack is labeled 'Rack' and has a corresponding temperature sensor icon. The racks are organized into 'Row 2' and 'Row 1'. A color-coded temperature scale on the right indicates 'Units: Cool Capacity (kW)' ranging from 0.0 to 10.0. The interface also shows a 'Recent Events' panel on the left and a 'Current View' dropdown menu.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p data-bbox="766 261 1850 293">https://www.dksh.com/global-en/products/iot/vertiv-thermal-control-and-monitoring</p> <p data-bbox="766 318 1877 496">CyrusOne also uses CyrusOne cooling to generate a 3D temperature map based on real sensor readings retrieved throughout the data center. CyrusOne cooling determines if there is a failure indication of the effectiveness of the active cooling configuration, which shows pattern differentials between the empirical and template atmospheric maps.</p> <div data-bbox="766 518 1892 1105"></div> <p data-bbox="766 1135 1640 1170">https://www.cyrusone.com/data-center-solutions/colocation, at 1:27.</p>

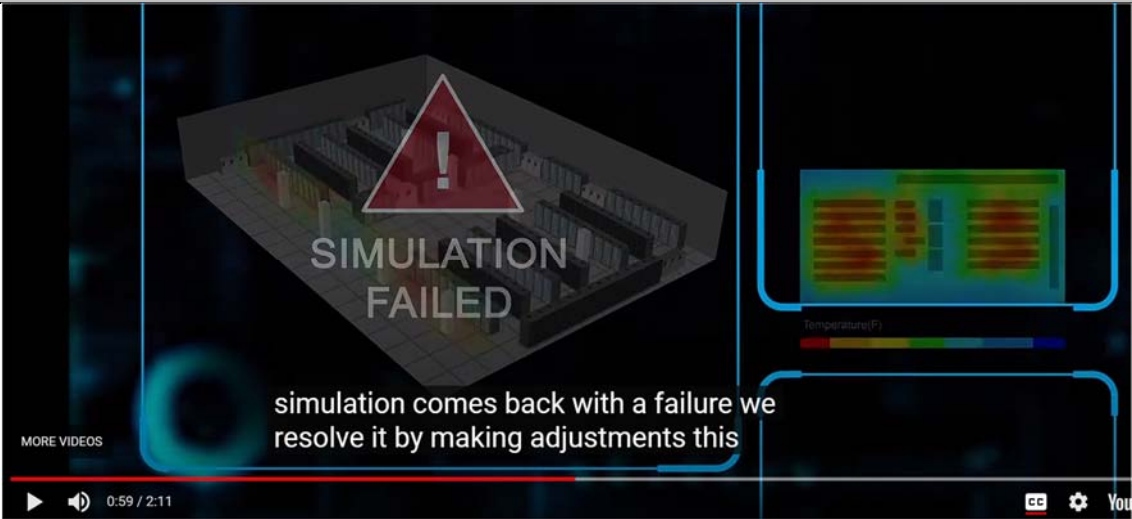

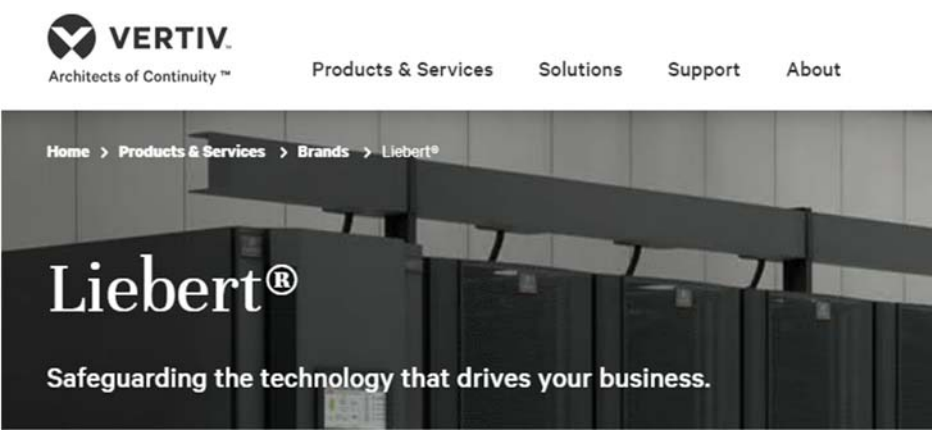

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	 <p>simulation comes back with a failure we resolve it by making adjustments this</p> <p>https://www.cyrusone.com/data-center-solutions/colocation , at 0:59.</p>



Exhibit 9

U.S. Patent No. 6,854,287 – Infringement Claim Chart

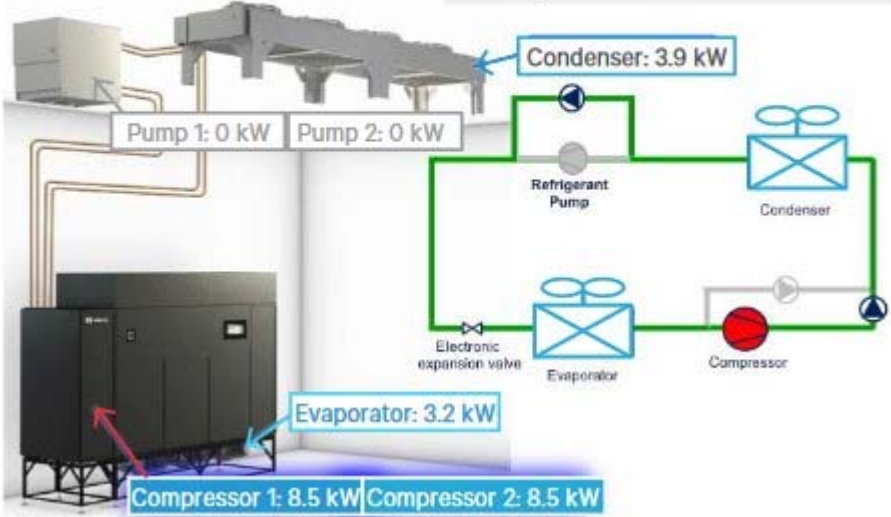
Claim 1	Exemplary Evidence of Infringement by CyrusOne
<p>[1pre] A method for cooling a room configured to house a plurality of computer systems, said method comprising:</p>	<p>CyrusOne’s data centers use a method for cooling a room configured to house a plurality of computer systems.</p> <p>For example, CyrusOne uses Vertiv (Liebert) CRAC units in each colocation data center. Liebert CRAC units are controlled by Liebert’s iCOM Intelligent Communication and Monitoring system.</p> <div data-bbox="774 609 1014 930"> <p>CIN99</p> <p>CyrusOne Data Center Cincinnati - Blue Ash 4600 McAuley Place, 4th Floor Cincinnati, OH 45242</p> <p>Located on McAuley Place, this Cincinnati data center facility is for customers that require a robust data center for mission-critical applications, as well as for disaster recovery and business continuity environments.</p> </div> <div data-bbox="1050 612 1871 1188">   <p>Overview</p> <ul style="list-style-type: none"> • 15,000 sq. ft. data center/8,000 colo square feet (CSF) • Up to 900 kW available • 12-inch raised floor design • 20, and 22 ton Liebert Downflow Chilled Water CRAC units. </div> <p>https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 1.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p data-bbox="787 284 886 316">Cooling</p> <ul data-bbox="787 332 1192 544" style="list-style-type: none">• N+1 Cooling• Redundant DX and Glycol Chillers• Redundant raised floor CRAC units• 12in Raised floor <p data-bbox="758 592 1627 673">https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 2.</p> <div data-bbox="758 738 1684 1166">A screenshot of the Vertiv Liebert website. At the top, the Vertiv logo is displayed with the tagline "Architects of Continuity™". Navigation links include "Products & Services", "Solutions", "Support", and "About". Below the navigation bar, a breadcrumb trail reads "Home > Products & Services > Brands > Liebert®". The main visual is a large image of server racks with the Liebert logo overlaid in white. Below the image, the text "Safeguarding the technology that drives your business." is visible.<p data-bbox="758 1185 1451 1218">https://www.vertiv.com/en-us/products/brands/liebert/</p></div>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<div data-bbox="758 256 1866 583"><p data-bbox="1472 331 1835 532">Liebert® iCOM™ Thermal System Controls Greater Data Center Protection, Efficiency & Insight</p></div> <p data-bbox="758 607 1803 678">https://www.vertiv.com/49d637/globalassets/shared/liebert-icom-thermal-system-controls-brochure.pdf (“iCOM Brochure”).</p>

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	<p>At the cooling unit level, the Liebert iCOM unit control provides the highest protection available and optimal performance.</p> <ul style="list-style-type: none"> • Monitors 380 unit and component points to eliminate single points of failure • Self-healing features avoid passing unsafe operating thresholds • Highly intuitive, full-color, touch screen simplifies operations to save time and reduce human error • Multiple, automated unit protection routines, including lead/lag, cascade, rapid restart, refrigerant protection and valve calibration  <p>At the supervisory level, the Liebert iCOM-S system control offers a revolutionary way to harmonize and optimize thermal system performance to optimize capacity across the data center, gain quick access to actionable data, and automate system diagnostics and trending.</p> <ul style="list-style-type: none"> • Advanced monitoring and at-a-glance reporting on performance metrics and trends for efficiency, capacity and adverse events • Up to 50% system efficiency gains • 30% lower deployment costs • Teamwork modes that prevent conflict between units and allow them to adapt to changes in facility and IT demand to improve efficiency and availability and reduce system wear and tear – saving more than \$10,000 per unit per year in energy costs • Simple and easy to deploy — auto-configuration to detect and configure up to 4,800 sensors, eliminating the need for custom integration to building management systems and cutting sensor deployment times in half  <p>Liebert iCOM unit control and Liebert iCOM-S system control are available for new Vertiv™ data center cooling units or as retrofits.</p> <p>iCOM Brochure at p. 3.</p>
[1a] providing a plurality of heat exchanger units configured to receive air from said room and to deliver air to said room;	<p>CyrusOne provides a plurality of heat exchanger units configured to receive air from said room and to deliver air to said room.</p> <p>For example, CyrusOne uses Liebert CRAC units which are heat exchangers that receive air from the room and deliver cool conditioned air to the room by transferring heat from the air to a fluid.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<div data-bbox="774 276 911 328" data-label="Section-Header"> <h2>CIN99</h2> </div> <div data-bbox="772 337 974 436" data-label="Text"> <p>CyrusOne Data Center Cincinnati - Blue Ash 4600 McAuley Place, 4th Floor Cincinnati, OH 45242</p> </div> <div data-bbox="772 449 1014 597" data-label="Text"> <p>Located on McAuley Place, this Cincinnati data center facility is for customers that require a robust data center for mission-critical applications, as well as for disaster recovery and business continuity environments.</p> </div> <div data-bbox="1083 280 1881 638" data-label="Image"> </div> <div data-bbox="1083 672 1407 855" data-label="Image"> </div> <div data-bbox="1444 665 1682 721" data-label="Section-Header"> <h2>Overview</h2> </div> <div data-bbox="1444 722 1820 833" data-label="List-Group"> <ul style="list-style-type: none"> • 15,000 sq. ft. data center/8,000 colo square feet (CSF) • Up to 900 kW available • 12-inch raised floor design • 20, and 22 ton Liebert Downflow Chilled Water CRAC units. </div> <div data-bbox="745 878 1631 953" data-label="Text"> <p>https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 1.</p> </div> <div data-bbox="774 995 879 1032" data-label="Section-Header"> <h2>Cooling</h2> </div> <div data-bbox="774 1044 1167 1242" data-label="List-Group"> <ul style="list-style-type: none"> • N+1 Cooling • Redundant DX and Glycol Chillers • Redundant raised floor CRAC units • 12in Raised floor </div> <div data-bbox="745 1289 1631 1365" data-label="Text"> <p>https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 2.</p> </div>

Claim 1	Exemplary Evidence of Infringement by CyrusOne						
[1b] supplying said plurality of heat exchanger units with cooling fluid from an air conditioning unit;	<p>CyrusOne supplies said plurality of heat exchanger units with cooling fluid from an air conditioning unit.</p> <p>For example, CyrusOne uses Liebert’s CRAC units which have an evaporator. Refrigerant cooling fluid flows through heat exchanger coils in evaporator.</p> <div><p>1. Full Compressor Mode</p><table><tr><th>COOLING MODE</th><th>OUTDOOR TEMP</th><th>COOLING PUE</th></tr><tr><td>Full Compressor</td><td>95</td><td>1.28</td></tr></table></div> <p>https://www.vertiv.com/49f1fd/globalassets/products/thermal-management/room-cooling/liebert-dse-sales-brochure-sl-18927_00.pdf.</p> <p>CyrusOne uses Liebert CRAC units which have a chilled water control valve. Chilled water cooling fluid flows through heat exchanger coils in evaporator.</p>	COOLING MODE	OUTDOOR TEMP	COOLING PUE	Full Compressor	95	1.28
COOLING MODE	OUTDOOR TEMP	COOLING PUE					
Full Compressor	95	1.28					

chilled water
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Chilled Water Control Valve

The chilled water valve provides proportional control action in response to room temperature and humidity as sensed by the microprocessor control. It includes operating linkage and electronic motor. Unlike other systems of this nature it requires no over-travel linkage or end switches to be adjusted. The control uses "intelligent logic" to eliminate valve hunting, thus greatly increasing the life of the valve. The valve can be a 3-way or 2-way to meet the appropriate requirements of the installed system.



Claim 1	Exemplary Evidence of Infringement by CyrusOne
	https://www.vertiv.com/491dda/globalassets/products/thermal-management/room-cooling/liebert-cw-brochure.pdf .
<p>[1c] cooling said received air through heat exchange with the cooling fluid in the plurality of heat exchanger units;</p>	<p>CyrusOne cools said received air through heat exchange with the cooling fluid in the plurality of heat exchanger units.</p> <p>For example, CyrusOne uses Liebert CRAC units to cool fluid (refrigerant) through the coil. The cooling fluid through the coil is chilled water/glycol. Liebert CRAC units receive the “return air” from the room and deliver cool conditioned “supply air” to the room, by transferring heat from the air to the cooling fluid within the coil.</p> <div data-bbox="764 695 1898 1287"> </div>

Claim 1	Exemplary Evidence of Infringement by CyrusOne																					
	https://www.vertiv.com/4afe7d/globalassets/products/thermal-management/room-cooling/liebert-dse-80-165kw-23-43-tons-downflow-system-design-manual.pdf , pp. 3, 6.																					
[1d] sensing temperatures at one or more locations in said room;	<p>CyrusOne senses temperatures at one or more locations in said room.</p> <p>For example, CyrusOne uses Liebert CRAC units and the Liebert CRAC unit control system senses temperatures at the supply sensor, remote sensor, or return sensor locations.</p> <p>3.1.12 Automatic Fan Speed Control</p> <p>Temperature sensors can control fan speed using one of three modes based on the type of sensor selected as the fan-control sensor: supply, return, or remote, see Table 3.2 below . Control is based on the selected sensor for both fan control and temperature control and their setpoints as follows:</p> <ul style="list-style-type: none">• Coupled: The fan control and temperature control sensor selection is the same. When coupled, fan speed is determined by the temperature setpoints.• Decoupled: The fan control and temperature control sensor selection is different. When decoupled, fan speed is determined by the fan setpoints. <p>Table 3.2 Fan Speed Controlling Sensor Options</p> <table><tr><th colspan="2" rowspan="2"></th><th colspan="3">Temperature Control Sensor Selected</th></tr><tr><th>Supply Sensor</th><th>Remote Sensor</th><th>Return Sensor</th></tr><tr><td rowspan="3">Fan Control Sensor Selected</td><td>Supply Sensor</td><td>Coupled</td><td>N/A</td><td>N/A</td></tr><tr><td>Remote Sensor</td><td>Decoupled (Recommended)</td><td>Coupled</td><td>N/A</td></tr><tr><td>Return Sensor</td><td>Decoupled</td><td>Decoupled</td><td>Coupled</td></tr></table> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 45.</p>			Temperature Control Sensor Selected			Supply Sensor	Remote Sensor	Return Sensor	Fan Control Sensor Selected	Supply Sensor	Coupled	N/A	N/A	Remote Sensor	Decoupled (Recommended)	Coupled	N/A	Return Sensor	Decoupled	Decoupled	Coupled
				Temperature Control Sensor Selected																		
		Supply Sensor	Remote Sensor	Return Sensor																		
Fan Control Sensor Selected	Supply Sensor	Coupled	N/A	N/A																		
	Remote Sensor	Decoupled (Recommended)	Coupled	N/A																		
	Return Sensor	Decoupled	Decoupled	Coupled																		

Claim 1	Exemplary Evidence of Infringement by CyrusOne																					
[1e] controlling at least one of the temperature of said cooling fluid and said air delivery by said plurality of heat exchanger units to said room in response to said sensed temperatures at said one or more locations; and	<p>CyrusOne controls at least one of the temperature of said cooling fluid and said air delivery by said plurality of heat exchanger units to said room in response to said sensed temperatures at said one or more locations.</p> <p>For example, CyrusOne uses Liebert CRAC units which have temperate sensors that control fan speed in response to sensed temperatures.</p> <p>3.1.12 Automatic Fan Speed Control</p> <p>Temperature sensors can control fan speed using one of three modes based on the type of sensor selected as the fan-control sensor: supply, return, or remote, see Table 3.2 below . Control is based on the selected sensor for both fan control and <u>temperature control and their setpoints as follows:</u></p> <ul style="list-style-type: none">• Coupled: The fan control and temperature control sensor selection is the same. When coupled, fan speed is determined by the temperature setpoints.• Decoupled: The fan control and temperature control sensor selection is different. When decoupled, fan speed is determined by the fan setpoints. <p>Table 3.2 Fan Speed Controlling Sensor Options</p> <table><tr><th colspan="2" rowspan="2"></th><th colspan="3">Temperature Control Sensor Selected</th></tr><tr><th>Supply Sensor</th><th>Remote Sensor</th><th>Return Sensor</th></tr><tr><td rowspan="3">Fan Control Sensor Selected</td><td>Supply Sensor</td><td>Coupled</td><td>N/A</td><td>N/A</td></tr><tr><td>Remote Sensor</td><td>Decoupled (Recommended)</td><td>Coupled</td><td>N/A</td></tr><tr><td>Return Sensor</td><td>Decoupled</td><td>Decoupled</td><td>Coupled</td></tr></table> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 45.</p> <p>The Liebert cooling unit controls activates the flow of chilled water/glycol, and varies cooling capacity by adjusting a motorized ball valve.</p>			Temperature Control Sensor Selected			Supply Sensor	Remote Sensor	Return Sensor	Fan Control Sensor Selected	Supply Sensor	Coupled	N/A	N/A	Remote Sensor	Decoupled (Recommended)	Coupled	N/A	Return Sensor	Decoupled	Decoupled	Coupled
				Temperature Control Sensor Selected																		
		Supply Sensor	Remote Sensor	Return Sensor																		
Fan Control Sensor Selected	Supply Sensor	Coupled	N/A	N/A																		
	Remote Sensor	Decoupled (Recommended)	Coupled	N/A																		
	Return Sensor	Decoupled	Decoupled	Coupled																		



Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>7.1.4 Temperature Control with a Fluid Economizer</p> <p>When an economizer is installed, the cooling requirement (determined by the temperature proportional band) is addressed first by the economizer's secondary cooling. If the economizer cooling capacity is insufficient, the compressor(s) begin cooling to bring the room air temperature down to the temperature setpoint.</p> <p>The fluid economizer employs a motorized ball valve that controls the flow of chilled water/glycol to provide a cooling capacity from 0% to 100%.</p> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 110.</p>
<p>[1f] wherein the step of controlling said air delivery by said plurality of heat exchanger units comprises individually manipulating a mass flow rate of the cooling fluid supplied to each of the plurality of heat exchanger units.</p>	<p>CyrusOne controls said air delivery by said plurality of heat exchanger units comprises individually manipulating a mass flow rate of the cooling fluid supplied to each of the plurality of heat exchanger units.</p> <p>For example, CyrusOne uses Liebert CRAC units which have Teamwork mode. Teamwork mode evaluates changes in the air temperature of the inlet, outlet, or supply temperature of the heat dissipating devices and adjusts one or more cooling units controls to provide the required cooling capacity.</p> <p>6 Teamwork, Standby and Rotation for Cooling Units</p> <p>U2U communication via private network and additional hardware (see U2U Networking on page 95) allows the following operating features for the cooling units:</p> <ul style="list-style-type: none"> • Teamwork • Standby (Rotation) • Cascade <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 99.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>6.2.3 Teamwork Mode 1—Parallel Operation</p> <p>In Teamwork mode 1, fan speed and cooling capacity are ramped up in parallel, which means that all units operate identically.</p> <p>Teamwork mode 1 is best for small rooms with balanced heat loads. A master unit collects the controlling readings for temperature and humidity from all the operating (fan on) units in the group, then determines the average or worst-case reading, and sends operating instructions to efficiently distribute cooling capacity across available units.</p> <p>In Teamwork mode 1, most parameters are shared and, when set in any unit, are set in all units in the group.</p> <p>6.2.4 Teamwork Mode 2—Independent Operation</p> <p>Teamwork mode 2 works well for most applications, and best in large rooms with un-balanced heat loads by preventing units in a group from operating in opposing modes, some cooling and some heating. All temperature and humidity parameters are shared by the group. The master unit monitors all available unit-sensor readings and determines the demand for cooling, heating, humidification and dehumidification, then sends operating instructions to address the greatest demand.</p> <p>In Teamwork mode 2, the setpoints for all units must be identical. The proportional band, deadband, and related settings may differ by unit. Fan speed is modulated per unit. Rotation and cascading is not available, so expect uneven distribution of work hours.</p> <p>6.2.5 Teamwork Mode 3—Optimized Aisle Operation</p> <p>In Teamwork Mode 3, the fan speed for all units operates in parallel, which means fan speed operation is identical at each unit. However, cooling capacity operates independently for each unit.</p> <p>Teamwork mode 3 takes advantage of variable speed fan options and variable capacity component options to maintain rooms with an unbalanced load and to prevent units in a group from operating in opposing modes. All units operate in the same mode based on the average or worst case (maximum) readings from the unit sensors. A local control (cooling capacity supply sensor) provides input to manage and maintain the discharge-air temperature at each unit. In addition, fan speed and operation are controlled based on readings from the unit temperature or static pressure sensors to control air delivery to the cold aisle.</p> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 102.</p> <p>The Liebert CRAC units also have standby mode. Standby mode evaluates changes in the air temperature of the inlet, outlet, or supply temperature of the heat dissipating devices and activates/de-activates one or more cooling units to provide the required cooling capacity.</p>

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	<p data-bbox="795 326 1562 362">6.3 Assigning Cooling Units to Standby (Lead/Lag)</p> <p data-bbox="795 394 1856 446">Standby assigns some units to operate while others are on standby, meaning a unit is idle but ready to become active in the event of an alarm condition in one of the operating units or based on a rotation schedule.</p> <p data-bbox="795 470 1818 522">When a unit is in standby mode, fan(s) are off and no cooling occurs. In multiple cooling unit systems, assigning units to standby lets you:</p> <ul data-bbox="869 547 1856 672" style="list-style-type: none">• Configure redundancy in case of failure scenarios (standby).• Manage cooling unit run time (lead/lag). See Setting a Rotation Schedule on the next page .• Modulate for very low loads to full design load (to be temperature reactive) by cascading activation of standby units (configured when setting up teamwork mode). <p data-bbox="753 703 1797 771">https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 103.</p>

Exhibit 10

U.S. Patent No. 6,862,179 – Infringement Claim Chart

Claim 1	Exemplary Evidence of Infringement by CyrusOne
<p>[1pre] A method of cooling a plurality of racks in a data center, said method comprising:</p>	<p>CyrusOne’s data centers use a method of cooling a plurality of racks in a data center.</p> <p>For example, CyrusOne uses Vertiv (Liebert) downflow chilled water CRAC units in the colocation data center. Liebert CRAC units are controlled by Liebert’s iCOM Intelligent Communication and Monitoring system.</p> <div data-bbox="787 570 1026 893"> <p>CIN99</p> <p>CyrusOne Data Center Cincinnati - Blue Ash 4600 McAuley Place, 4th Floor Cincinnati, OH 45242</p> <p>Located on McAuley Place, this Cincinnati data center facility is for customers that require a robust data center for mission-critical applications, as well as for disaster recovery and business continuity environments.</p> </div> <div data-bbox="1066 574 1892 1151">   <p>Overview</p> <ul style="list-style-type: none"> • 15,000 sq. ft. data center/8,000 colo square feet (CSF) • Up to 900 kW available • 12-inch raised floor design • 20, and 22 ton Liebert Downflow Chilled Water CRAC units. </div> <p>https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 1.</p>

Cooling

- N+1 Cooling
- Redundant DX and Glycol Chillers
- Redundant raised floor CRAC units
- 12in Raised floor

https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 2.



VERTIVTM

Liebert[®]

iCOM[™] Thermal System Controls

Greater Data Center Protection,
Efficiency & Insight

<https://www.vertiv.com/49d637/globalassets/shared/liebert-icom-thermal-system-controls-brochure.pdf> (“iCOM Brochure”).

At the cooling unit level, the Liebert iCOM unit control provides the highest protection available and optimal performance.

- Monitors 380 unit and component points to eliminate single points of failure
- Self-healing features avoid passing unsafe operating thresholds
- Highly intuitive, full-color, touch screen simplifies operations to save time and reduce human error
- Multiple, automated unit protection routines, including lead/lag, cascade, rapid restart, refrigerant protection and valve calibration



At the supervisory level, the Liebert iCOM-S system control offers a revolutionary way to harmonize and optimize thermal system performance to optimize capacity across the data center, gain quick access to actionable data, and automate system diagnostics and trending.

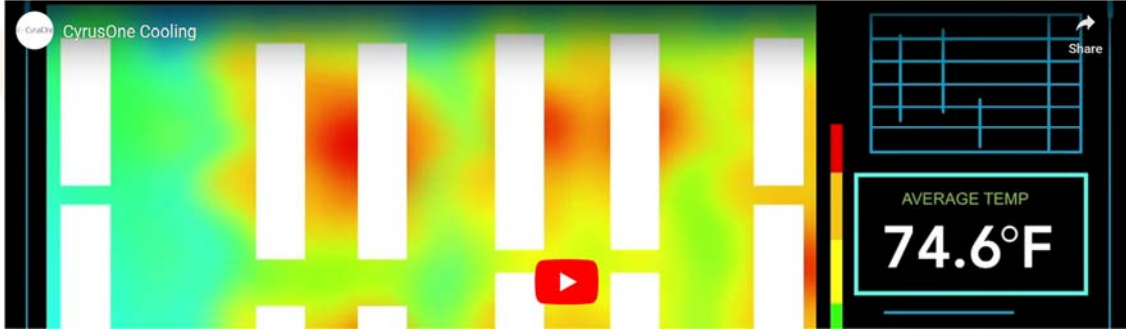
- Advanced monitoring and at-a-glance reporting on performance metrics and trends for efficiency, capacity and adverse events
- Up to 50% system efficiency gains
- 30% lower deployment costs
- Teamwork modes that prevent conflict between units and allow them to adapt to changes in facility and IT demand to improve efficiency and availability and reduce system wear and tear – saving more than \$10,000 per unit per year in energy costs
- Simple and easy to deploy — auto-configuration to detect and configure up to 4,800 sensors, eliminating the need for custom integration to building management systems and cutting sensor deployment times in half



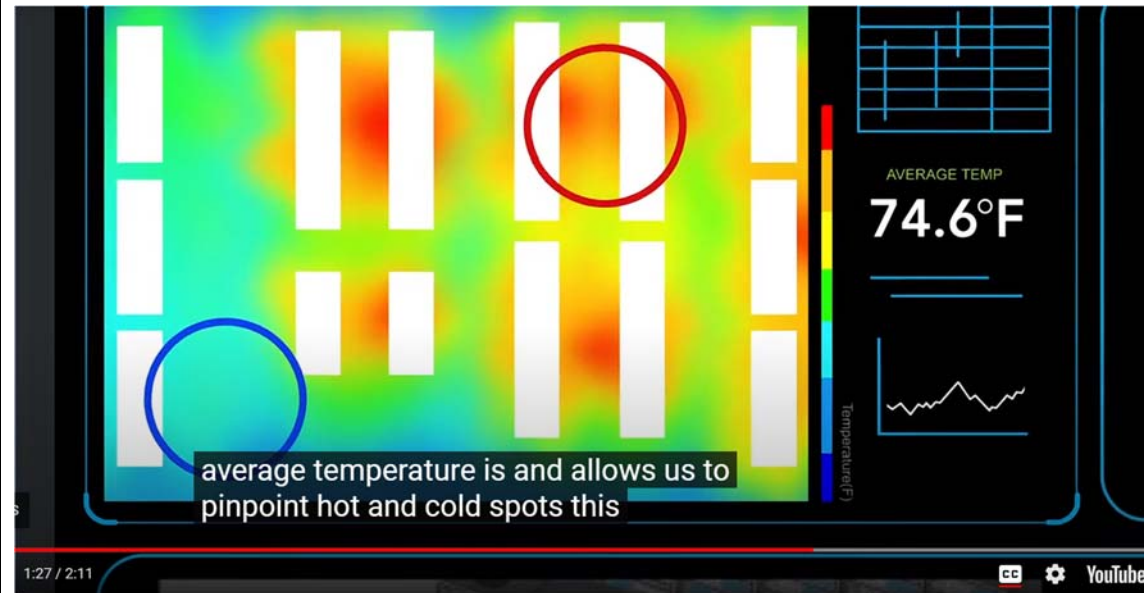
Liebert iCOM unit control and Liebert iCOM-S system control are available for new Vertiv™ data center cooling units or as retrofits.

iCOM Brochure at p. 3.


CyrusOne also uses CyrusOne cooling to continuously optimize air flow in its colocation data centers.

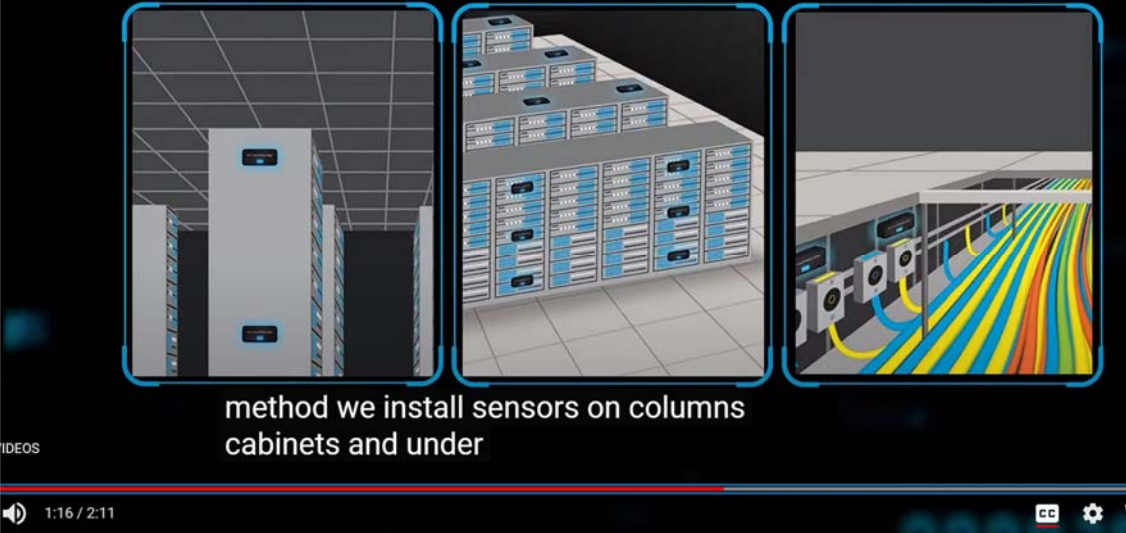
	<p>CyrusOne's data center cooling systems are some of the most advanced in the world employing proactive and reactive methods to keep customer's data halls running at the most optimal temperatures.</p>  <p>https://www.cyrusone.com/data-center-solutions/colocation.</p>
<p>[1a] activating a cooling device and opening a controllable partition configured to vary a supply of cooling fluid within a zone of said data center, said zone including at least one associated rack of said plurality of racks;</p>	<p>CyrusOne activates a cooling device and opening a controllable partition configured to vary a supply of cooling fluid within a zone of said data center, said zone including at least one associated rack of said plurality of racks.</p> <p>For example, Liebert's iCOM Intelligent Communication and Monitoring fluid economizer system activates the flow of chilled water/glycol, and varies cooling capacity by adjusting a motorized ball valve (controllable partition).</p> <p>7.1.4 Temperature Control with a Fluid Economizer</p> <p>When an economizer is installed, the cooling requirement (determined by the temperature proportional band) is addressed first by the economizer's secondary cooling, if the economizer cooling capacity is insufficient, the compressor(s) begin cooling to bring the room air temperature down to the temperature setpoint.</p> <p>The fluid economizer employs a motorized ball valve that controls the flow of chilled water/glycol to provide a cooling capacity from 0% to 100%.</p> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 110.</p>

CyrusOne also uses CyrusOne Cooling which is a closed-loop system that reacts to real-time data, automatically identifies and eliminates hot spots and helps diagnose potential facility risks by making adjustments.

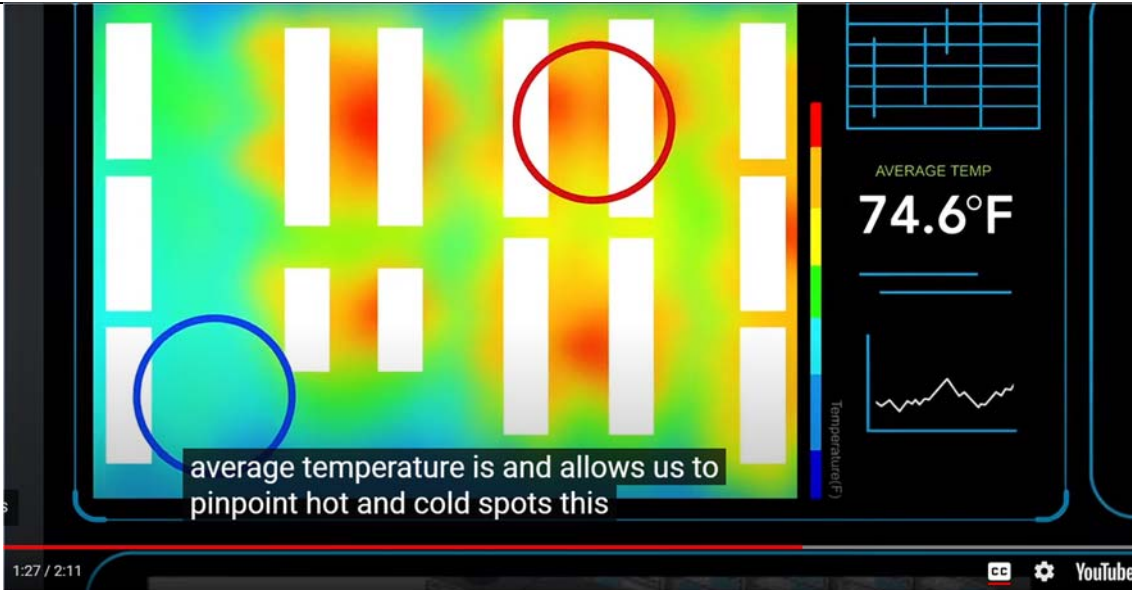


<https://www.cyrusone.com/data-center-solutions/colocation>, at 1:27.

	 <p>https://www.cyrusone.com/data-center-solutions/colocation, at 0:59.</p>
<p>[1b] sensing the temperature of said at least one associated rack;</p>	<p>CyrusOne senses the temperature of said at least one associated rack.</p> <p>For example, CyrusOne uses Liebert cooling units and the Liebert cooling unit control system senses temperatures.</p> <p>13.2 Installing Wired Remote Sensors</p> <p>Up to 10 remote sensor modules, installed in the monitored racks and connected to the cooling unit, provide control and reference input to iCOM and building-management systems. Using remote, rack sensors combats cooling problems related to recirculation air, uneven rack loading, and air distribution.</p> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 180.</p> <p>CyrusOne also uses CyrusOne cooling which installs temperature sensors to determine exactly where the heat load is within the data center. Data is wirelessly transmitted to network gateways, aggregated, and sent to a purpose-built appliance where it is analyzed by control software. Control commands are then delivered to the cooling equipment.</p>

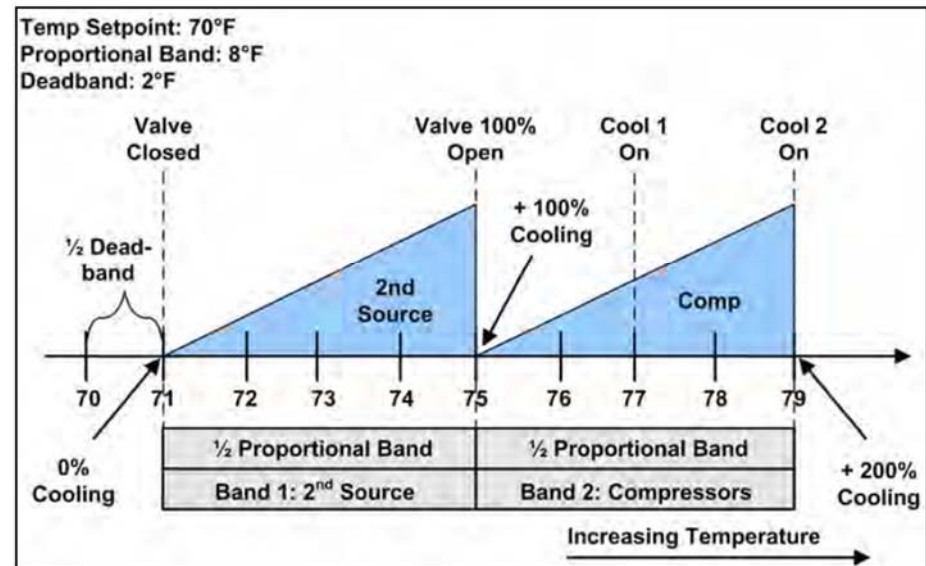
	 <p>method we install sensors on columns cabinets and under</p> <p>https://www.youtube.com/watch?v=yFMS-88wXn8, at 1:16.</p>
<p>[1c] determining whether said sensed temperature is within a predetermined temperature range; and</p>	<p>CyrusOne determines whether said sensed temperature is within a predetermined temperature range.</p> <p>For example, CyrusOne uses the Liebert iCOM system which is able to identify if the temperature is at the setpoint value, and change the response to the varied flow field based on length of time temperature has deviated, and amount of deviation from setpoint.</p>

	<p>Temperature Integration Time</p> <p>Adjusts amount of cooling/heating based on the length of time the temperature has deviated from the setpoint. The time selected is the amount of time it will take cooling capacity to reach 100%. For example, if three minutes is selected, cooling capacity will increase to 100% in three minutes.</p> <p>NOTE: Three to five minutes of integration time is adequate for most applications. See Considerations when Using PI Temperature Control on page 28 .</p> <p>NOTE: Only used when Temperature Control Type is PI.</p> <p>Temperature Proportional Band</p> <p>Adjusts the activation point of cooling/heating components based on deviation from setpoint by placing half of the selected value on each side of the temperature control setpoint. A smaller number causes faster reaction to temperature changes.</p> <p>NOTE: Setting this too low causes short cycling of compressors.</p> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 25.</p> <p>CyrusOne also uses CyrusOne Cooling to determine whether the sensed temperature is within a predetermined temperature range, for example, by using hot and cold spots.</p>
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	 <p>https://www.cyrusone.com/data-center-solutions/colocation, at 1:27.</p>
<p>[1d] manipulating said controllable partition to vary said supply of said cooling fluid to said zone in response to said sensed temperature being outside said predetermined temperature range.</p>	<p>CyrusOne manipulates said controllable partition to vary said supply of said cooling fluid to said zone in response to said sensed temperature being outside said predetermined temperature range.</p> <p>CyrusOne uses Liebert’s iCOM system to manipulate the motorized ball valve (controllable partition) from 0% to 100% flow of chilled water/glycol.</p> <p>7.1.4 Temperature Control with a Fluid Economizer</p> <p>When an economizer is installed, the cooling requirement (determined by the temperature proportional band) is addressed first by the economizer’s secondary cooling, if the economizer cooling capacity is insufficient, the compressor(s) begin cooling to bring the room air temperature down to the temperature setpoint.</p> <p>The fluid economizer employs a motorized ball valve that controls the flow of chilled water/glycol to provide a cooling capacity from 0% to 100%.</p>

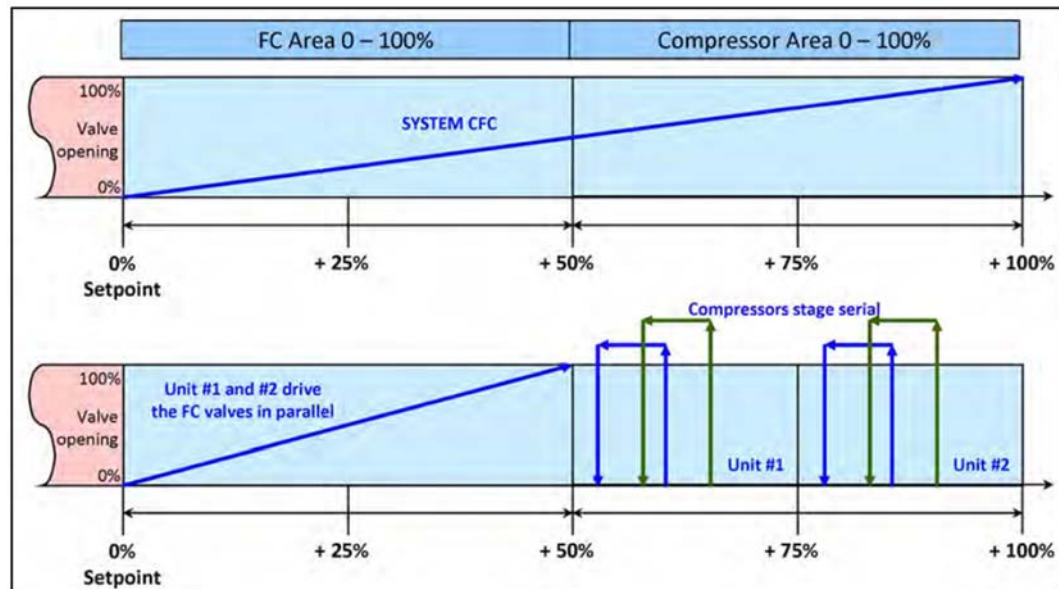
https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 110.

Figure 3.17 Second Cooling Source and Two-Step Compressorized Cooling



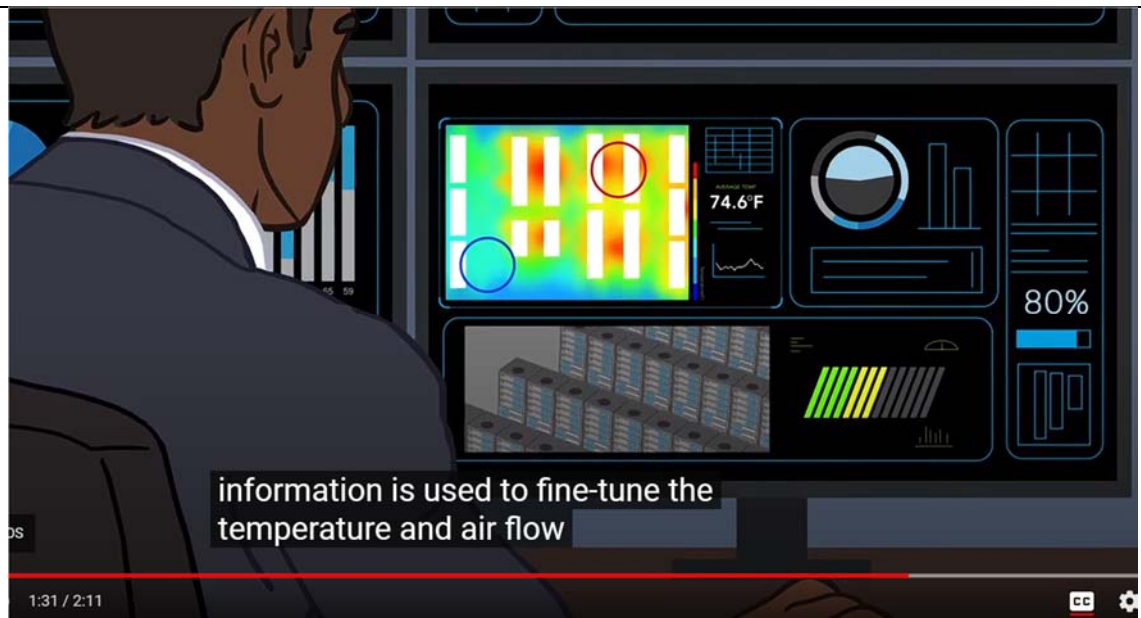
https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 69, Fig. 3.17.

Figure 3.18 Freecooling and Compressorized Operation



https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf, p. 70, Fig. 3.18.



CyrusOne also uses CyrusOne Cooling Optimize to adjust cooling output by fine-tuning the air flow.

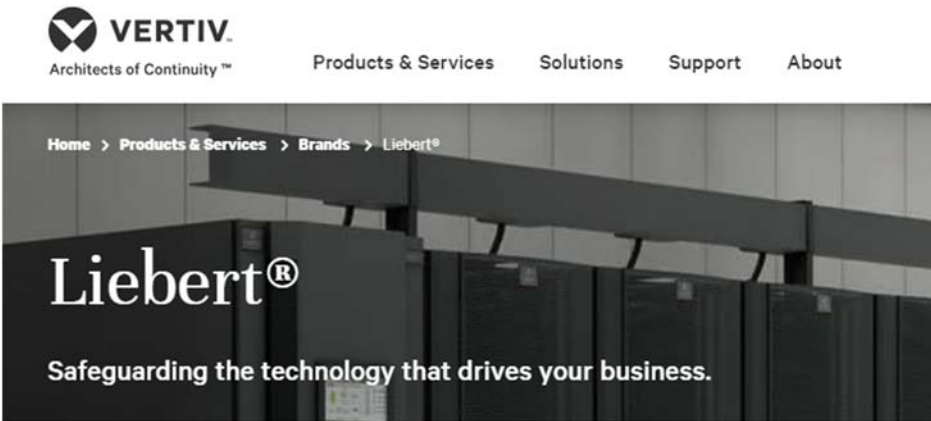



<https://www.cyrusone.com/data-center-solutions/colocation>, at 1:31.



Exhibit 11

U.S. Patent No. 7,031,870 – Infringement Claim Chart

Claim 1	Exemplary Evidence of Infringement by CyrusOne
<p>[1pre] A method for evaluating one or more components in a data center, the method comprising:</p>	<p>CyrusOne’s data centers use a method for evaluating one or more components in a data center.</p> <p>For example, CyrusOne uses Vertiv and Liebert cooling in its U.S. data centers to control atmospheric conditions. Liebert’s CRAC units are controlled, for example, by Liebert’s iCOM and/or iCOM-S Intelligent Communication and Monitoring System, which uses a method for evaluating one or more components in a data center.</p> <div data-bbox="787 649 919 701"> <p>CIN99</p> </div> <div data-bbox="787 712 982 808"> <p>CyrusOne Data Center Cincinnati - Blue Ash 4600 McAuley Place, 4th Floor Cincinnati, OH 45242</p> </div> <div data-bbox="787 826 1020 971"> <p>Located on McAuley Place, this Cincinnati data center facility is for customers that require a robust data center for mission-critical applications, as well as for disaster recovery and business continuity environments.</p> </div> <div data-bbox="1094 654 1887 1011">  </div> <div data-bbox="1094 1047 1417 1229">  </div> <div data-bbox="1461 1044 1688 1094"> <p>Overview</p> </div> <div data-bbox="1461 1099 1827 1206"> <ul style="list-style-type: none"> • 15,000 sq. ft. data center/8,000 colo square feet (CSF) • Up to 900 kW available • 12-inch raised floor design • 20, and 22 ton Liebert Downflow Chilled Water CRAC units. </div> <p>https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 1.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p data-bbox="795 282 890 315">Cooling</p> <ul data-bbox="795 331 1178 526" style="list-style-type: none"><li data-bbox="795 331 953 363">• N+1 Cooling<li data-bbox="795 388 1167 420">• Redundant DX and Glycol Chillers<li data-bbox="795 444 1178 477">• Redundant raised floor CRAC units<li data-bbox="795 501 999 534">• 12in Raised floor <p data-bbox="766 574 1635 639">https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 2.</p> <div data-bbox="766 721 1692 1138">A screenshot of the Vertiv Liebert website. At the top, the Vertiv logo is followed by the tagline "Architects of Continuity™". To the right are navigation links: "Products & Services", "Solutions", "Support", and "About". Below this is a breadcrumb trail: "Home > Products & Services > Brands > Liebert®". The main visual is a photograph of server racks in a data center. Overlaid on the image is the "Liebert®" logo in large white text, and below it, the tagline "Safeguarding the technology that drives your business." in smaller white text.</div> <p data-bbox="766 1162 1467 1195">https://www.vertiv.com/en-us/products/brands/liebert/.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	 <p data-bbox="766 592 1816 673">https://www.vertiv.com/49d637/globalassets/shared/liebert-icom-thermal-system-controls-brochure.pdf (“iCOM Brochure”).</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>At the cooling unit level, the Liebert iCOM unit control provides the highest protection available and optimal performance.</p> <ul style="list-style-type: none"> Monitors 380 unit and component points to eliminate single points of failure Self-healing features avoid passing unsafe operating thresholds Highly intuitive, full-color, touch screen simplifies operations to save time and reduce human error Multiple, automated unit protection routines, including lead/lag, cascade, rapid restart, refrigerant protection and valve calibration  <p>At the supervisory level, the Liebert iCOM-S system control offers a revolutionary way to harmonize and optimize thermal system performance to optimize capacity across the data center, gain quick access to actionable data, and automate system diagnostics and trending.</p> <ul style="list-style-type: none"> Advanced monitoring and at-a-glance reporting on performance metrics and trends for efficiency, capacity and adverse events Up to 50% system efficiency gains 30% lower deployment costs Teamwork modes that prevent conflict between units and allow them to adapt to changes in facility and IT demand to improve efficiency and availability and reduce system wear and tear – saving more than \$10,000 per unit per year in energy costs Simple and easy to deploy — auto-configuration to detect and configure up to 4,800 sensors, eliminating the need for custom integration to building management systems and cutting sensor deployment times in half  <p>Liebert iCOM unit control and Liebert iCOM-S system control are available for new Vertiv™ data center cooling units or as retrofits.</p> <p>iCOM Brochure at p. 3.</p>
[1a] detecting inlet and outlet temperatures of one or more heat dissipating devices;	<p>CyrusOne detects inlet and outlet temperatures of one or more heat dissipating devices.</p> <p>CyrusOne uses Liebert iCOM. Liebert iCOM detects inlet and outlet temperatures at server racks using wired, remote rack sensors.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>9.4 Wired Remote Sensors</p> <p>Wired, remote, rack sensors can function as control sensors and subsequently, provide input individually at the unit level or at the system level for temperature control and teamwork functions.</p> <p>Each wired remote rack sensor has two thermistors/probes. In Individual Sensor mode, the higher temperature reading or the average temperature reading of the two probes can be used. In Unit Sensors mode, some or all of the rack sensor's temperature readings are considered for higher (maximum) or average calculation. For example, setting three sensors as control and average for unit mode, averages the three highest temperature readings.</p> <p>https://www.vertiv.com/49b8b2/globalassets/shared/liebert-icom-user-manual_sl-31075.pdf (“iCOM Manual”) at p. 156.</p>
<p>[1b] detecting temperatures of air supplied by one or more computer room air conditioning (CRAC) units;</p>	<p>CyrusOne detects temperatures of air supplied by one or more computer room air conditioning (CRAC) units.</p> <p>CyrusOne uses Liebert iCOM. Liebert iCOM detects temperatures of air supplied by one or more CRAC units.</p> <p>13.4 Installing Supply Control Sensors</p> <p>13.4.1 Installing the Supply Air Temperature Sensor</p> <p>The supply temperature sensor is connected to P8, Pins 1 and 2 at the factory and requires no configuration.</p> <ol style="list-style-type: none"> 1. Place the sensor in an area that is influenced only by the unit to which it is connected to provide an accurate reading: 5 ft. to 15 ft. (1.5 m to 4.5 m) from the cooling unit, Figure 13.16 below. <p>iCOM Manual at p. 191.</p>
<p>[1c] calculating indices of air re-circulation for the one or more heat dissipating devices based upon the detected inlet temperatures, outlet temperatures and supplied air temperatures;</p>	<p>CyrusOne calculates indices of air re-circulation for the one or more heat dissipating devices based upon the detected inlet temperatures, outlet temperatures and supplied air temperatures.</p> <p>CyrusOne uses Liebert iCOM. Liebert iCOM calculates indices of air recirculation for server racks based on detected inlet, outlet, and supplied air temperatures.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>13.2 Installing Wired Remote Sensors</p> <p>Up to 10 remote sensor modules, installed in the monitored racks and connected to the cooling unit, provide control and reference input to iCOM and building-management systems. Using remote, rack sensors combats cooling problems related to recirculation air, uneven rack loading, and air distribution.</p> <p>iCOM Manual at p. 180.</p> <p>13.1 Return Air Temperature/Humidity Sensor</p> <p>The return temperature/humidity sensor is located in the unit return air section and is supplied on all Liebert®systems with iCOM™ controls. The assembly connects to plug connection P67 on the iCOM internal control board on all CRV systems.</p> <p>iCOM Manual at p. 179.</p> <p>13.4 Installing Supply Control Sensors</p> <p>13.4.1 Installing the Supply Air Temperature Sensor</p> <p>The supply temperature sensor is connected to P8, Pins 1 and 2 at the factory and requires no configuration.</p> <ol style="list-style-type: none"> 1. Place the sensor in an area that is influenced only by the unit to which it is connected to provide an accurate reading: 5 ft. to 15 ft. (1.5 m to 4.5 m) from the cooling unit, Figure 13.16 below . <p>iCOM Manual at p. 191.</p> <p>Temperature Control Sensor</p> <p>Selects sensor that controls cooling. Values are:</p> <ul style="list-style-type: none"> • Supply Sensor: Temperature control is based on maintaining the temperature of the discharge air from the cooling unit. See Supply Sensors on page 158 . • Remote Sensor: Temperature control is based on the temperature reading(s) from wired remote/rack sensor(s). See Wired Remote Sensors on page 156 . • Return Sensor: Temperature control is based on maintaining the temperature of the room air. • Customer input setpoint (remote alarm device)

Claim 1	Exemplary Evidence of Infringement by CyrusOne																					
	iCOM Manual at p. 25.																					
[1d] varying a flow field setting of air delivered to the one or more heat dissipating devices;	<p>CyrusOne varies a flow field setting of air delivered to the one or more heat dissipating devices.</p> <p>CyrusOne uses Liebert iCOM. Liebert iCOM varies the flow field setting of air delivered to server racks by, for example, controlling fan speed.</p> <p>3.1.12 Automatic Fan Speed Control</p> <p>Temperature sensors can control fan speed using one of three modes based on the type of sensor selected as the fan-control sensor: supply, return, or remote, see Table 32 below . Control is based on the selected sensor for both fan control and temperature control and their setpoints as follows:</p> <ul style="list-style-type: none">• Coupled: The fan control and temperature control sensor selection is the same. When coupled, fan speed is determined by the temperature setpoints.• Decoupled: The fan control and temperature control sensor selection is different. When decoupled, fan speed is determined by the fan setpoints. <p>Table 3.2 Fan Speed Controlling Sensor Options</p> <table><tr><th colspan="2" rowspan="2"></th><th colspan="3">Temperature Control Sensor Selected</th></tr><tr><th>Supply Sensor</th><th>Remote Sensor</th><th>Return Sensor</th></tr><tr><th rowspan="3">Fan Control Sensor Selected</th><th>Supply Sensor</th><td>Coupled</td><td>N/A</td><td>N/A</td></tr><tr><th>Remote Sensor</th><td>Decoupled (Recommended)</td><td>Coupled</td><td>N/A</td></tr><tr><th>Return Sensor</th><td>Decoupled</td><td>Decoupled</td><td>Coupled</td></tr></table> <p>iCOM Manual at p. 45.</p>			Temperature Control Sensor Selected			Supply Sensor	Remote Sensor	Return Sensor	Fan Control Sensor Selected	Supply Sensor	Coupled	N/A	N/A	Remote Sensor	Decoupled (Recommended)	Coupled	N/A	Return Sensor	Decoupled	Decoupled	Coupled
				Temperature Control Sensor Selected																		
		Supply Sensor	Remote Sensor	Return Sensor																		
Fan Control Sensor Selected	Supply Sensor	Coupled	N/A	N/A																		
	Remote Sensor	Decoupled (Recommended)	Coupled	N/A																		
	Return Sensor	Decoupled	Decoupled	Coupled																		
[1e] determining whether the indices of air re-circulation has changed in response to the varied flow field settings; and	<p>CyrusOne determines whether the indices of air re-circulation has changed in response to the varied flow field settings.</p> <p>CyrusOne uses Liebert iCOM. Liebert iCOM determines whether the indices of air re-circulation have changed in response to varied flow field settings, by for example</p>																					

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>changing the response to varying fan speeds based on the length of time temperature has deviated and the amount of deviation from the setpoint.</p> <p>Temperature Integration Time</p> <p>Adjusts amount of cooling/heating based on the length of time the temperature has deviated from the setpoint. The time selected is the amount of time it will take cooling capacity to reach 100%. For example, if three minutes is selected, cooling capacity will increase to 100% in three minutes.</p> <p>NOTE: Three to five minutes of integration time is adequate for most applications. See Considerations when Using PI Temperature Control on page 28 .</p> <p>NOTE: Only used when Temperature Control Type is PI.</p> <p>Temperature Proportional Band</p> <p>Adjusts the activation point of cooling/heating components based on deviation from setpoint by placing half of the selected value on each side of the temperature control setpoint. A smaller number causes faster reaction to temperature changes.</p> <p>NOTE: Setting this too low causes short cycling of compressors.</p> <p>iCOM Manual at p. 25.</p>
<p>[1f] evaluating the one or more components based upon changes in the indices of air re-circulation for the one or more heat dissipating devices at the various flow field settings.</p>	<p>CyrusOne evaluates the one or more components based upon changes in the indices of air re-circulation for the one or more heat dissipating devices at the various flow field settings.</p> <p>CyrusOne uses Liebert iCOM. Liebert iCOM evaluates the components based on changed in the indices of air re-circulation for the server racks at various flow field settings. For example, Teamwork Mode evaluates changes in the air temperature of the inlet, outlet, or supply temperature of the heat dissipating devices and adjusts one or more cooling units controls to provide the required cooling capacity, and Standby Mode evaluates these changes and activates/deactivates one or more CRAC units to provide required cooling capacity.</p>



Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p data-bbox="779 272 1801 316">6 Teamwork, Standby and Rotation for Cooling Units</p> <p data-bbox="779 354 1854 410">U2U communication via private network and additional hardware (see U2U Networking on page 95) allows the following operating features for the cooling units:</p> <ul data-bbox="856 435 1071 535" style="list-style-type: none">• Teamwork• Standby (Rotation)• Cascade <p data-bbox="766 565 1064 597">iCOM Manual at p. 99.</p>

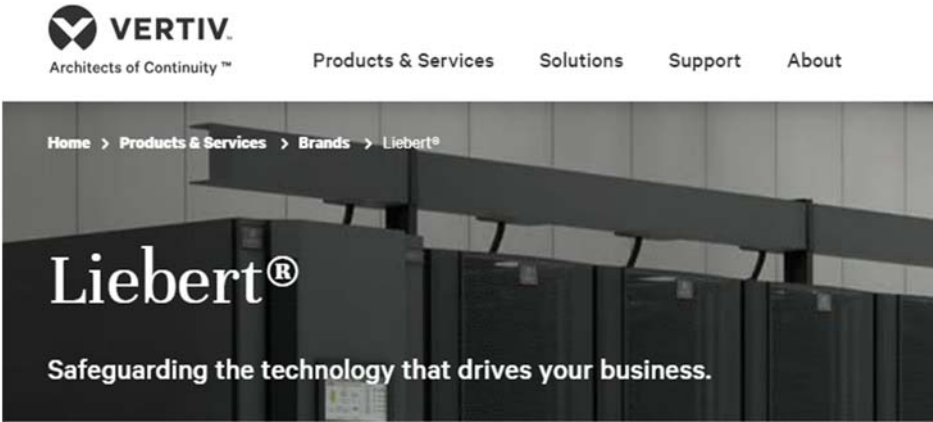
Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>6.2.3 Teamwork Mode 1—Parallel Operation</p> <p>In Teamwork mode 1, fan speed and cooling capacity are ramped up in parallel, which means that all units operate identically.</p> <p>Teamwork mode 1 is best for small rooms with balanced heat loads. A master unit collects the controlling readings for temperature and humidity from all the operating (fan on) units in the group, then determines the average or worst-case reading, and sends operating instructions to efficiently distribute cooling capacity across available units.</p> <p>In Teamwork mode 1, most parameters are shared and, when set in any unit, are set in all units in the group.</p> <p>6.2.4 Teamwork Mode 2—Independent Operation</p> <p>Teamwork mode 2 works well for most applications, and best in large rooms with un-balanced heat loads by preventing units in a group from operating in opposing modes, some cooling and some heating. All temperature and humidity parameters are shared by the group. The master unit monitors all available unit-sensor readings and determines the demand for cooling, heating, humidification and dehumidification, then sends operating instructions to address the greatest demand.</p> <p>In Teamwork mode 2, the setpoints for all units must be identical. The proportional band, deadband, and related settings may differ by unit. Fan speed is modulated per unit. Rotation and cascading is not available, so expect uneven distribution of work hours.</p> <p>6.2.5 Teamwork Mode 3—Optimized Aisle Operation</p> <p>In Teamwork Mode 3, the fan speed for all units operates in parallel, which means fan speed operation is identical at each unit. However, cooling capacity operates independently for each unit.</p> <p>Teamwork mode 3 takes advantage of variable speed fan options and variable capacity component options to maintain rooms with an unbalanced load and to prevent units in a group from operating in opposing modes. All units operate in the same mode based on the average or worst case (maximum) readings from the unit sensors. A local control (cooling capacity supply sensor) provides input to manage and maintain the discharge-air temperature at each unit. In addition, fan speed and operation are controlled based on readings from the unit temperature or static pressure sensors to control air delivery to the cold aisle.</p> <p>iCOM Manual at p. 102.</p>


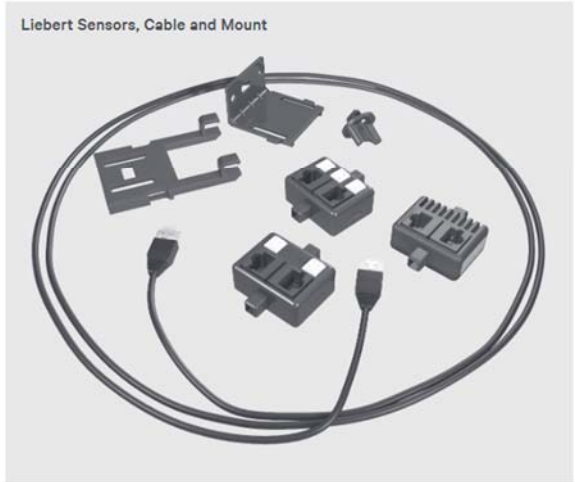
Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p data-bbox="800 267 1560 305">6.3 Assigning Cooling Units to Standby (Lead/Lag)</p> <p data-bbox="800 334 1850 389">Standby assigns some units to operate while others are on standby, meaning a unit is idle but ready to become active in the event of an alarm condition in one of the operating units or based on a rotation schedule.</p> <p data-bbox="800 410 1814 466">When a unit is in standby mode, fan(s) are off and no cooling occurs. In multiple cooling unit systems, assigning units to standby lets you:</p> <ul data-bbox="873 487 1850 613" style="list-style-type: none">• Configure redundancy in case of failure scenarios (standby).• Manage cooling unit run time (lead/lag). See Setting a Rotation Schedule on the next page .• Modulate for very low loads to full design load (to be temperature reactive) by cascading activation of standby units (configured when setting up teamwork mode). <p data-bbox="768 659 1079 696">iCOM Manual at p. 103.</p>


Exhibit 12

U.S. Patent No. 7,339,490 – Infringement Claim Chart


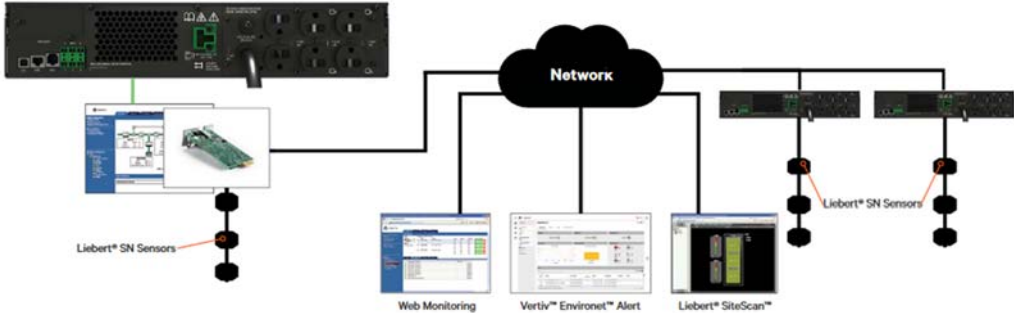
Claim 1	Exemplary Evidence of Infringement by CyrusOne
<p>[1pre] A modular sensor assembly for sensing a condition at a computer rack, comprising:</p>	<p>CyrusOne’s data centers use a modular sensor assembly for sensing a condition at a computer rack.</p> <p>For example, CyrusOne uses Vertiv and Liebert cooling in its U.S. data centers to control atmospheric conditions. On information and belief, CyrusOne’s Liebert CRAC units are used in conjunction with Liebert’s modular sensors, which are used to sense conditions such as temperature, humidity, and door-open status at a computer rack.</p> <div data-bbox="787 649 1022 971"> <p>CIN99</p> <p>CyrusOne Data Center Cincinnati - Blue Ash 4600 McAuley Place, 4th Floor Cincinnati, OH 45242</p> <p>Located on McAuley Place, this Cincinnati data center facility is for customers that require a robust data center for mission-critical applications, as well as for disaster recovery and business continuity environments.</p> </div> <div data-bbox="1066 654 1890 1230">   <p>Overview</p> <ul style="list-style-type: none"> • 15,000 sq. ft. data center/8,000 colo square feet (CSF) • Up to 900 kW available • 12-inch raised floor design • 20, and 22 ton Liebert Downflow Chilled Water CRAC units. </div> <p>https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 1.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p data-bbox="793 280 884 313">Cooling</p> <ul data-bbox="793 329 1157 516" style="list-style-type: none">• N+1 Cooling• Redundant DX and Glycol Chillers• Redundant raised floor CRAC units• 12in Raised floor <p data-bbox="766 565 1638 638">https://documents.cyrusone.com/wp-content/uploads/2023/06/2022-CIN97_Cincinnati.pdf, p. 2.</p> <div data-bbox="766 654 1694 1073">A screenshot of the Vertiv Liebert website. At the top, the Vertiv logo is followed by the tagline "Architects of Continuity™". To the right are navigation links: "Products & Services", "Solutions", "Support", and "About". Below this is a breadcrumb trail: "Home > Products & Services > Brands > Liebert®". The main visual is a photograph of server racks in a data center. Overlaid on the left side of the image is the "Liebert®" logo in large white text, and below it, the tagline "Safeguarding the technology that drives your business." in smaller white text.<p data-bbox="766 1092 1470 1133">https://www.vertiv.com/en-us/products/brands/liebert/</p></div>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<div data-bbox="772 261 1138 370">LIEBERT® SN™ MODULAR SENSORS Quick Installation Guide</div> <div data-bbox="1444 256 1642 305"> VERTIV</div> <div data-bbox="772 406 1033 509"><p>The Liebert SN modular sensors monitor temperature, humidity, door-open status, and digital input, such as smoke or water, in any area.</p><p>These instructions apply to the following Liebert SN modular-sensor models:</p></div> <div data-bbox="785 576 1029 740"><ul style="list-style-type: none">• SN-T—1 temperature probe• SN-TH—1 temperature probe and 1 humidity probe• SN-2D—1 door-switch probe with 2 inputs• SN-3C—1 digital-input probe with 3 inputs</div> <div data-bbox="772 747 1033 808"><p>Each modular sensor ships with a 6.6-ft (2-m) cable to connect with a Liebert monitoring product.</p></div> <div data-bbox="772 816 940 857"><p>SENSOR-STRING COMPATIBLE</p></div> <div data-bbox="772 867 1020 888"><p>You can attach the sensors in a</p></div> <div data-bbox="1071 406 1642 885"><p>Liebert Sensors, Cable and Mount</p></div>

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	<p>2. Assemble the sensor and bracket If using the supplied bracket and base:</p> <ul style="list-style-type: none"> • Insert the support base into the end of the support. • Snap the sensor into the other end of the support. <p>3. Choose a mounting location Keeping in mind that the temperature and humidity sensors require an unobstructed air flow, and that the sensor does not obstruct vents and impede air flow, select a mounting location. The installation parts needed for various mounting options are included with the sensor. You can install the sensor on rack rails, rack doors, and on a flat surface.</p> <p>MOUNT THE SENSOR Use the step appropriate to your chosen mounting method:</p> <p>4. Mounting on a Knurr® Rack-frame or 19-in. Rail Insert the quarter-turn, tool-less fastener a slot on the support or base, place the bracket on the frame or rail, and turn the fastener clockwise (1/4 turn) to secure the sensor in place.</p> <p>5. Mounting on rack door</p> <ul style="list-style-type: none"> • On a Knurr rack (only), use the supplied screws through the slots on the support or use the quarter-turn fastener to secure the sensor to the door. • On all other racks (including Knurr), use cable ties to secure the sensor or support bracket to the door. <p>6. Mounting on a flat surface Clean the mounting location with the supplied alcohol pad(s), then affix the sensor support to the surface using the supplied Dual Lock fasteners.</p> <p>7. Mounting on a rack rail This method requires a standard, pan-head rack screw, not supplied with the sensor. Use the pan-head rack screw through a slot on the sensor support or base to secure the sensor in place.</p> <p>CONNECT THE SENSOR The integrated cable connects to the SN Sensor port on your Liebert product. The Liebert SN sensor ports are RJ45 ports designated with the sensor-port icon.</p> <p> ports are RJ45 ports designated with the sensor-port icon.</p> <p>NOTE: Only use the SN sensor port to connect Liebert SN sensors.</p> <p>CONFIGURE THE SENSOR Using the sensor address recorded before installation, use the web user interface of your Liebert product to acknowledge the sensor connection and configure parameters including labeling the sensor and setting thresholds for alarm/warning triggers.</p> <p>https://www.vertiv.com/49782f/globalassets/shared/liebert-sn-modular-sensors-quick-start-guide_00.pdf</p>
[1a] a) an elongate flexible body, configured to attach to a computer rack;	<p>CyrusOne's modular sensor assemblies comprise an elongate flexible body, configured to attach to a computer rack.</p> <p>CyrusOne uses Liebert CRAC units with Liebert sensors. Liebert modular sensors attached in a strong consist of an elongate flexible body that attaches to a computer rack frame, rail, or door.</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>SENSOR-STRING COMPATIBLE</p> <p>You can attach the sensors in a string, and the string can be a combination of integrated and modular sensors. (Integrated sensors are one or more probes integrated on a single cable.)</p> <p>A string may include up to 10 probes and be a maximum of 65.6 ft (20 m).</p> <p>The number of probes that may be used with Liebert monitoring products varies. Refer to the product's user guide for details.</p> <p>https://www.vertiv.com/49782f/globalassets/shared/liebert-sn-modular-sensors-quick-start-guide_00.pdf</p>

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	<div data-bbox="766 261 1879 349"> <p>Vertiv™ Liebert® SN Sensors</p>  </div> <div data-bbox="781 370 1079 396"> <p>Vertiv™ Liebert® GXT5 UPS</p> </div> <div data-bbox="781 412 1789 722">  </div> <div data-bbox="766 755 1879 828"> <p>https://www.vertiv.com/4a84b9/globalassets/shared/liebert-sn-sensors-monitoring-for-business-critical-continuity2.pdf</p> </div>
<p>[1b] b) a plurality of addressable sensors, disposed along the body and interconnected to a common connector wire; and</p>	<p>CyrusOne’s modular sensor assemblies comprise a plurality of addressable sensors, disposed along the body and interconnected to a common connector wire.</p> <p>CyrusOne uses Liebert CRAC units with Liebert sensors. Liebert modular sensors are disposed along the body and interconnected to a common connector wire (string) and are addressable.</p>

SENSOR-STRING COMPATIBLE

You can attach the sensors in a string, and the string can be a combination of integrated and modular sensors. (Integrated sensors are one or more probes integrated on a single cable.)

A string may include up to 10 probes and be a maximum of 65.6 ft (20 m).

The number of probes that may be used with Liebert monitoring products varies. Refer to the product's user guide for details.

PREPARING FOR INSTALLATION

1. Record the address of each sensor.

During configuration, the web user interface displays the addresses of all connected sensors.

Before mounting or connecting, locate the sensor address on the sensor housing (see the picture on the following page) and record it.



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	https://www.vertiv.com/49782f/globalassets/shared/liebert-sn-modular-sensors-quick-start-guide_00.pdf
<p>[1c] c) a connector wire lead, configured to interconnect the connector wire to a central system configured to receive and interpret data from the plurality of sensors relating to conditions associated with the computer rack.</p>	<p>CyrusOne’s modular sensor assemblies comprise a connector wire lead, configured to interconnect the connector wire to a central system configured to receive and interpret data from the plurality of sensors relating to conditions associated with the computer rack.</p> <p>CyrusOne uses Liebert CRAC units with Liebert sensors. Liebert modular sensors string at each computer rack is interconnected to a central system (network) to receive and interpret the sensors from multiple computer racks. The networked sensor system is configured with thresholds for alarm and warning triggers.</p> <div data-bbox="766 722 1858 1185"> <p>The diagram illustrates the integration of Liebert SN sensors with a central network for monitoring. At the top, a 'Vertiv™ Liebert® GXT5 UPS' is shown. Below it, a 'Liebert® SN Sensors' unit is connected to a central 'Network' cloud. The network is then connected to three monitoring interfaces: 'Web Monitoring', 'Vertiv™ Environet™ Alert', and 'Liebert® SiteScan™'. The diagram also shows two additional Liebert® SN Sensors connected to the network, indicating a multi-rack setup.</p> </div> <p>https://www.vertiv.com/4a84b9/globalassets/shared/liebert-sn-sensors-monitoring-for-business-critical-continuity2.pdf</p>

Claim 1	Exemplary Evidence of Infringement by CyrusOne
	<p>CONFIGURE THE SENSOR</p> <p>Using the sensor address recorded before installation, use the web user interface of your Liebert product to acknowledge the sensor connection and configure parameters including labeling the sensor and setting thresholds for alarm/warning triggers.</p> <p>https://www.vertiv.com/49782f/globalassets/shared/liebert-sn-modular-sensors-quick-start-guide_00.pdf.</p>